THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXIII. No. 574.] LONDON, MAY 12, 1874. [26th Year.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 30, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
Address G. H. Ramsay, Newcastle-on-Tyne.

GENUINE TORBAY PAINT
AND
ANTI-GALVANIC PAINT.
FOUR PRIZE MEDALS.
WORKS: BRIXHAM, TORBAY.
These Paints are now used in 160 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov. 2, 1866.*
STEVENS AND CO.,
London Office, 21, Great Winchester Street, E.C.

HENRY SKOINES,
PATENTEE & CONTRACTING GAS ENGINEER
FOR
SETTING RETORTS,
ERECTING AND REMODELLING
GAS-WORKS OF ANY EXTENT,
AT HOME OR ABROAD.
Address—
7, ARGYLE ST., KING'S CROSS, LONDON, W.C.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Coal Office,
Quay Side, Newcastle-on-Tyne.
Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL AND CO.,
THE OLD TUBE-WORKS, WEDNESBURY
AND
THE ALMA WORKS, WALSALL.
Established at the commencement of Gas Lighting.
Warehouses:
69, UPPER THAMES STREET;
COMMERCIAL STREET, SPITALFIELDS;
5, CHARLES STREET, SOHO; and
16, SOHO SQUARE, } LONDON
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
J. R. and Co. are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
69, UPPER THAMES STREET, LONDON.

JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
Established 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM.
MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Agent—W. G. DAVIS, 2, Brabant Court, Philpot Lane, E.C.

SCOTTISH CANNEL COAL.
J. & W. ROMANS, Consulting Gas Engineers and Coal Factors, of Edinburgh and London, CONTRACT for supplying any quantity of COAL and CANNEL.
They are also Contractors for leasing Gas-Works, for supplying, erecting, or repairing gas apparatus and fire-clay goods.
Messrs. Romans, being lessees of several Gas-Works, have their Cannels tested in the ordinary working process, thus securing for their customers a guarantee beyond mere laboratory experiments.
Analysis, prices, and other information will be forwarded on application to their Offices, 8, Forth Street, Edinburgh; 1, Walbrook, Mansion House, London, or to the "Crown Wharf," Thomas Street, Limehouse, London, where stocks of house, steam, and gas coal are always on hand.
Coal, machinery, fire goods, &c., shipped to all parts of the world.

THE
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
AGENT:
JAMES M'KELVIE,
HAYMARKET,
EDINBURGH.

GEORGE GLOVER & CO.,

PATENTEES OF THE
NATIONAL STANDARD GASOMETERS
For the English Government, and for the Government of the Netherlands;
MAKERS OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government;
AND MANUFACTURERS OF
IMPROVED
DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
236, GEORGE STREET, GLASGOW; and 15, MARKET STREET, MANCHESTER.

G. G. and Co. have just received the only Medal awarded for Gas-Meters at the Vienna International Exhibition.

SILVER MEDAL, PARIS EXHIBITION, 1867.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES AND FITTINGS

AND

LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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WAREHOUSES:

LONDON: 157, UPPER THAMES STREET, E.C.

LIVERPOOL: No. 63, Paradise Street. | PARIS: No. 38, Rue du Chateau d'Eau.

MANCHESTER: Barlow's Croft, Chapel Street, Salford. | LILLE: No. 38, Rue Grande Chaussee.

DANIEL HOWARD,

Successor to the late BENJAMIN WHITEHOUSE,

(ESTABLISHED IN 1765,)

BOILER AND GASHOLDER WORKS,

Westbromwich, near Birmingham.

MANUFACTURER OF TELESCOPE AND SINGLE GASHOLDERS,

WROUGHT & CAST IRON TANKS

FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS,

And all kinds of GAS APPARATUS.

Wrought-Iron Roofs, Bridges, and Girders; Steam, Hot Water, and Range Boilers; Tanks, Cisterns, &c.,

And all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, and ESTIMATES FURNISHED.

LAMBERT BROTHERS, WALSALL.

ALPHA TUBE & FITTING WORKS

HENRY HOWARD & CO.,

COOMBS WOOD PATENT TUBE-WORKS.

OLD HILL, near DUDLEY,

MANUFACTURERS OF

HOWARD'S PATENT IMPROVED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

Also ORDINARY WELDED WROUGHT-IRON TUBES and FITTINGS,

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

London Agent—W. G. DAVIS, 2, Brabant Court, Philpot Lane, E.C.

LIME SUPERSEDED

IN THE

PURIFICATION OF ILLUMINATING GAS,

BY

Spence's Patent Dry Copperas,

The only Purifying Material which removes, by one process, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of four years at some of the largest Gas-Works in the Kingdom.

TESTIMONIALS SENT ON APPLICATION.

SPENCE BROTHERS CHEMICAL COMPANY, LIMITED,

VICTORIA CHEMICAL WORKS, ASHTON NEW ROAD, BRADFORD, MANCHESTER,

Manufacturers of SPENCE'S PATENT DRY COPPERAS; GREEN COPPERAS;

SPENCE'S PATENT GAS DEODORIZER;

SULPHATE OF AMMONIA, GREY AND BROWN; SULPHURIC ACID; MUDIE'S DISINFECTANT, &c.

CONTRACTORS FOR THE PURCHASE OF SPENT OXIDE.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE WORKS.

WHITEHOUSE AND COMPANY, LIMITED,

GLOBE TUBE-WORKS, WEDNESBURY; & VICTORIA TUBE-WORKS, GREAT BRIDGE, STAFFORDSHIRE,

MANUFACTURERS OF

PATENT WELDED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

GAS-FITTERS TOOLS, STEAM COCKS, AND ALL KINDS OF JOINTS.

HYDRAULIC TUBES, CORE BARS, TELEGRAPH POSTS, COILS, &c.

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JOSEPH AIRD,

WELLINGTON TUBE-WORKS,

GREAT BRIDGE, TIPTON, STAFFORDSHIRE,

MANUFACTURER OF

PATENT WELDED WROUGHT-IRON GAS, STEAM, HYDRAULIC, GALVANIZED, & ENAMELLED TUBES & FITTINGS.

FLETCHER AND MURPHY,

GARRATT STREET WORKS, OLDHAM ROAD, MANCHESTER;

Manufacturers of

IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

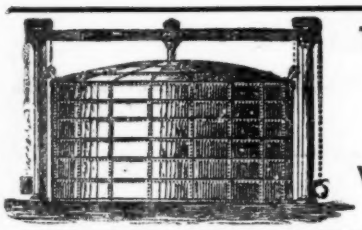
AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.



W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD

MANUFACTURERS OF

RETORTS, ANNULAR AND PIPE CONDENSERS,

WROUGHT AND CAST IRON SCRUBBERS, PURIFIERS,

GASHOLDERS,

GOVERNORS, AND ALL THE NECESSARY FITTINGS FOR COMPLETING THE ERECTION OF GAS-WORKS.

STATION & CONSUMERS WET OR DRY METERS, STREET & SERVICE MAINS, LAMP COLUMNS & BRACKETS, & WROUGHT-IRON TUBES AND FITTINGS; WROUGHT-IRON ROOFS FOR ANY SIZE OF BUILDINGS.

Sole Makers of B. W. Thurston's Combined Condensing, Scrubbing, and Washing Apparatus,

AND PATENTEES OF THE IMPROVED COMBINED CONDENSING AND PURIFYING APPARATUS SO EMINENTLY ADAPTED FOR EXPORTATION.

REFERENCES TO UPWARDS OF 300 GAS-WORKS.

1862. CLASS II.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

This Paint having been in general use over twelve years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

SPECIAL DRIERS FOR ANTIMONY PAINT SUPPLIED.

THE IMPERIAL METER COMPANY, LIMITED,

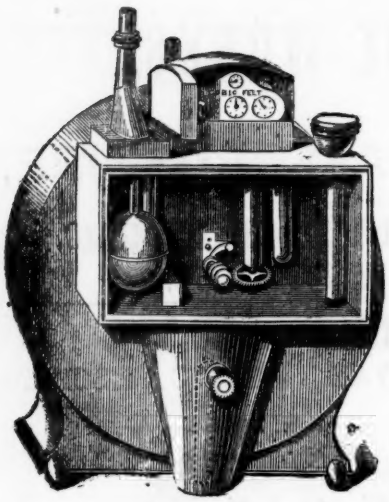
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

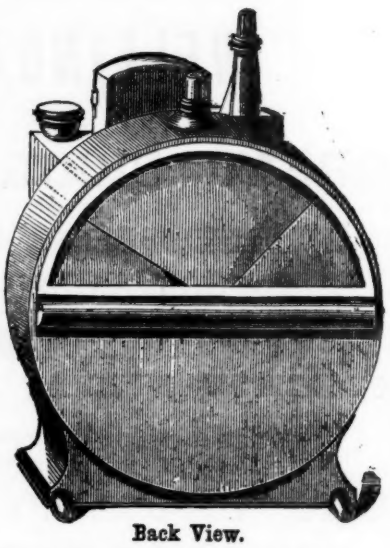
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



Back View.

I. This Meter is more simple in construction than the common non-compensating Meter.
II. An unvarying water-line is maintained.
III. No amount or kind of pressure will cause it to "flood."
IV. It is practically unaffected by "tilting."
V. The friction is less than in any other Meter; and
VI. It will last for twelve months without requiring to be refilled.

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

SPECIAL ATTENTION

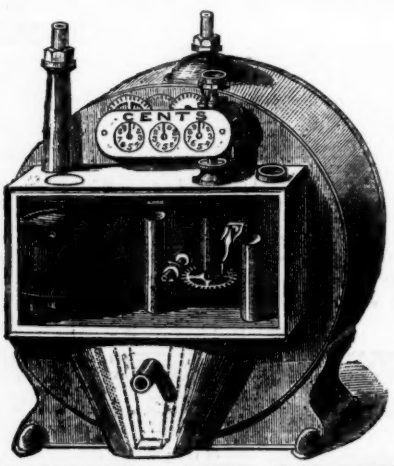
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



THE IMPERIAL WET GAS-METER.
Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

WILLEY AND FORD,

GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

ENGINEERING DEPARTMENT.

NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

GASHOLDERS AND TANKS.

RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

METER DEPARTMENT.

They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

GAS-FITTING DEPARTMENT.

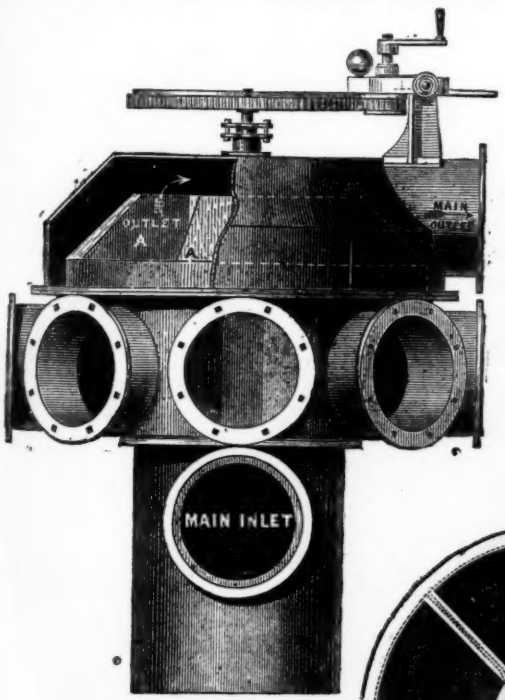
An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

☞ PLEASE NOTE THE ADDRESS—

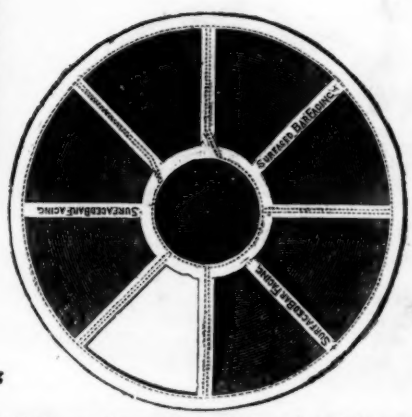
GAS ENGINEERING WORKS, COMMERCIAL ROAD, EXETER.

C. & W. WALKERS' PATENT CENTRE-VALVES.



Elevation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.

Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)



Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.

MIDLAND IRON-WORKS, DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

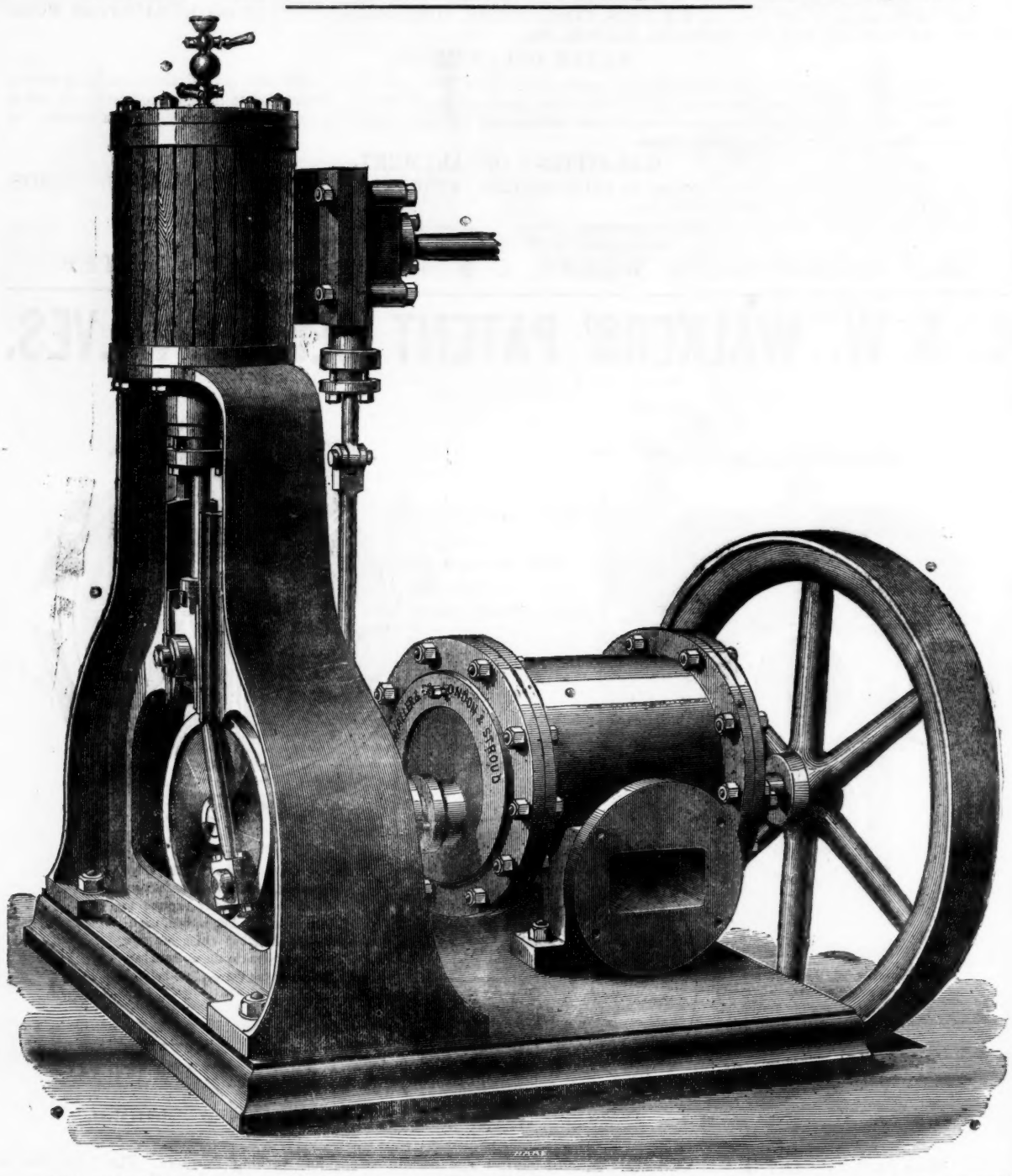
SOLE MAKERS OF

Beale's Improved

PATENT GAS-EXHAUSTERS AND COMBINED ENGINES,

ON ONE BASE PLATE.

NOTE.—The Exhausters are extra large for moderate speed.



This COMBINED VERTICAL ENGINE and EXHAUSTER was specially designed by G. WALLER AND Co. for small works, where space is an object, and is applicable for Exhausters from 1000 to 15,000 per hour. This is the *only* Engine and Exhauster **complete on one Base Plate,** requiring only one foundation.

NOTE.—They are sent away complete, and are easily fixed.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.,

AND AT

STROUD, GLOUCESTERSHIRE.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

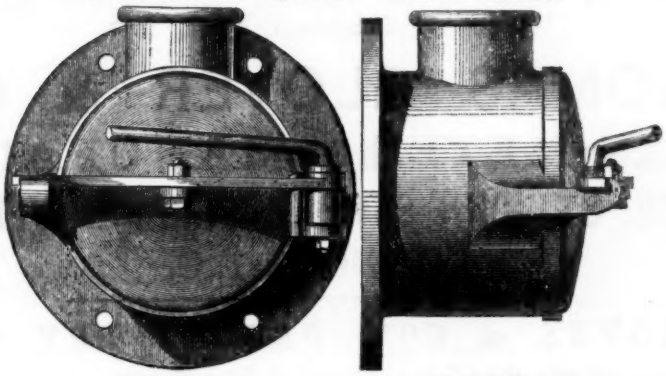
HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 10,000 IN USE.

NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW. SIDE VIEW.

SIMPLE.

ECONOMICAL.

DURABLE.

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).
" Gaslight Company, Bow Common.
" London Gaslight Company.
" Independent Gaslight Company.
" Phœnix Gaslight Company.
" South Metropolitan Gaslight Co.
The West Ham Gas Company.
" Imperial Gaslight Company.
" Gas-Works, Arsenal, Woolwich.
" Commercial Gas Company.
" Alliance and Dublin Gas-Works.
" Edinburgh Gas-Works.
" Manchester Corporatn. Gas-Works.
The Salford Corporation Gas-Works.
" Rochdale Corporation Gas-Works.
" Liverpool United Gas-Works.
" Birkenhead Gas-Works.
" Birmingham Gas-Works.
" Nottingham Gas-Works.
" Newcastle-on-Tyne Gas-Works.
The Carmarthen Gas-Works.
" Merthyr Tydfil Gas-Works.
" Ystrad Gas-Works.
" St. Alban's Gas-Works.
" Over Darwen Gas-Works.
" Aylesbury Gas-Works.
" Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

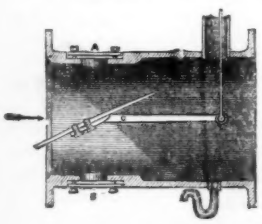
The following important Testimonial, among others, has been given:—

"*The Gaslight and Coke Company. Engineer's Office*, 6, *Westminster Chambers, Nov.* 14, 1871.

"Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them, and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) "F. J. EVANS."

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

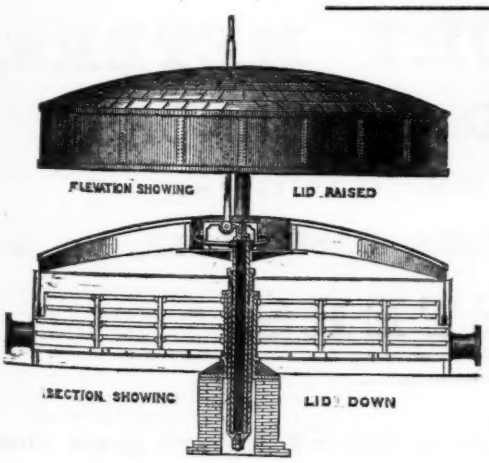
The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.
" " a 36 in. at Goswell Road Station.
" " a 24 in. at " "
" " a 24 in. at the Gas-Works, Beckton.
The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
" " an 8 in. at " "
" " a 24 in. at " "

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.



PATENT SELF-CONTAINED

DIRECT HYDRAULIC LIFT

FOR PURIFIER LIDS

REQUIRES NO TRAVELLERS, CRANES, CHAINS, OR OTHER GEAR.

SAFE, SIMPLE, AND DURABLE.

ANY SIZE LID MAY BE RAISED BY ONE MAN.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MAY 12, 1874.

Circular to Gas Companies.

The Alliance and Dublin Gas Company may be heartily congratulated on the results of the proceedings before the Committee of the House of Lords, which make their Bill safe. An amicable understanding was at last arrived at by the Corporation and the company, and the Bill will now encounter no further opposition. The arrangement made is, of course, a compromise. The proposal of the company was to give 16-candle gas at a maximum price of 5s. 6d. per 1000 feet; but they have given way a little, and consent to supply 16-candle gas for 5s. 4d. per 1000 feet. There was in the original Bill a proposal that the consumers might, if they wished, have 14-candle gas for 5s. per 1000 feet, and we are somewhat sorry that this quality and price were not agreed to when the compromise was made. We believe that such terms in the end would have proved quite satisfactory to the consumers, and more advantageous to the company. The Corporation, we presume, would not agree to accept gas of a lower quality than that formerly supplied. It must be understood, however, that the arrangement come to is to last only two years. After July 1, 1876, the maximum price is to fall to 5s. per 1000 cubic feet; but if after that time the company still find their business unremunerative, they are to have power to apply to the Board of Trade for a revision of price, as under the Gas and Water Facilities Act Amendment Act, 1873, and clauses have been introduced into the Bill to provide for this revision. A public examiner, who will combine in his own person the functions of the simple examiner and the chief examiner in this metropolis, is to be appointed by the Board of Trade, and paid by the company, who have also to pay £500 to the Citizens Committee, who, we cannot help thinking, factiously opposed them.

Such are the leading features of the arrangement arrived at, and now the company have a clear course before them if they can raise their new capital. As we have the utmost confidence in the future of the company under good management, we can have little doubt that the money will soon be forthcoming. Only the most untoward circumstances can prevent the undertaking being transformed into a prosperous concern, and we believe that investors may safely deposit their money.

The report of Mr. Foulis, however, which is now before us, but for which we have not space to-day, goes to show that the immediate advantage may not be great. He intimates that the almost entire reconstruction of the works is desirable, if not absolutely necessary, which must absorb a good portion of the new capital. We should have been glad, for obvious reasons, if Mr. Foulis had stated fully the grounds for his statement that he had never seen works of any magnitude more unsuitable for the economical production of gas, and to what portion of the works his objections apply. As a Corporation officer, Mr. Foulis naturally advocates the possession of gas undertakings by Corporations, on the ground that they should be regulated monopolies. But gas companies are regulated monopolies; and, notwithstanding all that has been said on the subject, we are still unconvinced that gas consumers are better off under Corporations than under companies.

As our readers will see Mr. Foulis's report next week, we need now make no further remark upon it; but we may say here that, on one point, he has not been fully informed. The company did make application to the Board of Trade for an increase of price, under the Gas and Water Works Facilities Act Amendment Act; but the Board refused to entertain the application, on the ground that it was made by directors, who were stated to have resigned their offices in consequence of charges of mismanagement.

The part of the Bill of the Nottingham Corporation that provides for the purchase of the Nottingham Gas Company has passed the Lords committee, subject to some alterations in clauses, of the nature of which we are not yet informed. Since, as we have before announced, the Corporation and the company had come to terms, and the Bill was practically unopposed by the company, no other result was to be expected. Thus another important undertaking falls into Corporation hands, but we venture to assert that the gas consumer in Nottingham will not derive the smallest advantage from the transfer. He will be doubly taxed in rates and gas profits, that is all. And if in the course of a few years he should see some handsome public buildings springing up, he will have the satisfaction of knowing that he has contributed more to their cost than his non-gas consuming neighbour.

In our issue for April 28, it was stated in the evidence of Mr. Thornton Andrews, on the Neath Corporation Bill, that the Corporation proposed to purchase the undertaking of the Neath New Gas Company for £33,000. Since then an agreement to purchase on those terms has been confirmed by a large majority at a meeting of the Corporation. The nominal capital of the company is £17,130, but something remains to be paid up on the last issue of shares. The terms of purchase may, therefore, be deemed satisfactory, as they amount to more than 23 years purchase of the statutory dividends. The Corporation will come into possession of admirable works, and a promising district, and to them the results will, no doubt, prove extremely gratifying.

The Bill to incorporate a company with power to purchase the private gas undertaking of the Messrs. Malam and Brothers, at Enniskillen, has passed a committee of the House of Lords, with the understanding that a clause shall be introduced, giving the Town Commissioners of Enniskillen power to purchase the undertaking within one year of the passing of the Act, for 16⅔ years purchase of the average net profits of the previous two years. If the commissioners neglect to give notice within the specified time, they may still acquire the undertaking within two years, paying, however, 20 years purchase of the profits. The company in this interval becomes established as a statutory undertaking, and such terms are only reasonable. If there be any spirit in the commissioners, they will purchase the works at once. But public spirit is dormant in Ireland; and, with reference to this matter, we notice a remark in an Enniskillen paper that "the purchase, if the town should desire it, will probably be "much facilitated by a Bill likely to pass this session, which will "empower Town Commissioners, and other corporate bodies, to "borrow money on very advantageous terms from the Board of "Works." The Metropolitan Board of Works is, of course, referred to; but we have before expressed our belief that the Legislature will not allow the Board to embark in the money-lending career they propose.

The New Gas Company have held their first annual meeting, and no one can say that the report of the directors is entirely unsatisfactory. Of course, there was no dividend to declare; but nobody is to be blamed for that. It is the misfortune of such companies that they pay—and pay large sums—for unproved inventions, and time must elapse, and heavy expense be incurred, for practical and intelligent men to render what are for the most part speculative processes—"crude ideas," as they have been called—practical successes. There is no doubt that all connected with the management of the New Gas Company are sincerely desirous to make the "crude idea," for which so much money was paid, a useful and valuable invention. We applaud their

efforts, and shall not regret to see them succeed. A great deal was said at the meeting, by men who ought to have known better, about the obstacles which "vested interests" place in the way of the adoption of improvements. We venture, with as much knowledge on the subject as any one possesses, to assert that gas companies do not offer a stubborn opposition to improvements. What they say practically amounts to this:—"We must earn our dividends. "With our present process we can do this, and give as much satis- "faction to the public as is to be expected. If you know a better "process, prove its value, and then we will consider the question "of its adoption." And, for our own part, we will be bold, and say with Mr. Spice, that, as soon as the success of the new gas process is demonstrated, its adoption by all metropolitan companies is inevitable. The Chichester works are, it appears, now abandoned; but the experience arrived at in the experiments there have been of great value to the company. It was found that the supply of "new" gas was eminently unsatisfactory; but a mixture of equal parts of common gas and "new" gas gives a light which in Chichester was not complained of. This, therefore, is the plan now definitely adopted by the company. They are to supply a mixture of common and "new" gas, and if they can only get retorts to stand for the production of water gas, the success of the company, we are told, is assured. It will be seen that the company have acquired the works of the West London Junction Company, who have supplied the Great Western Railway Station and Hotel at Paddington, and who have been brought to grief by the high price of coals. They have also made a provisional arrangement for the adoption of the process at the works of the Crystal Palace District Gas Company, who certainly favour new inventions. In these two establishments the company have a fair field for giving an adequate trial to the process, with the most recent improvements devised by Mr. Spice, and we shall await the results with much curiosity and interest.

With regard to the Tunis undertaking, we may suggest that it would be worth while to try in a hot climate the effect of "new" gas, pure and simple. We have a strong opinion that the want of luminosity in the flame of this gas is due rather to the use of a burner ill adapted for its consumption, than the condensation of the vapour of the petroleum; still, it might turn out that "new" gas would succeed better in a hot than a cold climate, and if this should prove to be the fact, the company would gain great advantages by its use alone.

WATER AND SANITARY NOTES.

The report of Mr. J. Jackson, the consulting engineer of the Corporation of Liverpool, on the future water supply of that city, has been published, and proves, as might be expected, an able and interesting document. The present dry season, and the probable recurrence of cycles of such seasons, creates alarm among Liverpool people, who look to the future with considerable anxiety. It was calculated by the late Mr. Duncan that, in ten years, the population to be supplied from the Corporation works would number 1,065,000, whose requirements, estimated at 30 gallons per head per day, would reach 223,583,201 gallons per week. The consumption in 1873 was 123 millions of gallons weekly, and this year it is estimated that it will increase to 126 millions. It seems to be admitted that the present works, including the Yarrow reservoir—still uncompleted, and, according to some, never likely to be filled when finished, but in an exceptionally wet season—are inadequate for the supply of the above quantity of water. That there is no necessity for a supply of 30 gallons per head per day is clear, and that the proceedings of Mr. Deacon are gradually diminishing and greatly economizing water is granted. But still the Corporation are anxious about the future, and wisely look forward to provide for anticipated wants. Mr. Duncan, some years ago, proposed a scheme for bringing the water of Bala Lake to Liverpool; but the estimated cost—£1,500,000—frightened the Corporation, who decided to make an additional reservoir—the still unfinished Yarrow. Mr. Jackson objects, on various grounds, to the Bala scheme, and we join with him in the belief that Parliament would never sanction the scheme if proposed. The alternative sources to which he refers are, first of all, Windermere Lake, the estimated cost being as follows:—Immediate outlay and cost of pumping 10 million gallons per day, £1,714,521; if 20 million gallons were required, the cost would be increased by £1,338,233; making a total of £3,052,754. By deferring the outlay for the additional 10 million gallons for 10 years there would be a saving of interest upon the said sum of £1,338,233 in the meantime.

Mr. Jackson, however, urges objections to the Windermere scheme—the great distance (64 miles) from Liverpool, the cost of pumping, &c.—and in the end proposes a scheme of his own. This is for obtaining a supply from the head waters of the river Wyre, which, in his opinion, is a very favourable district for the purpose. The advantages of this scheme are its comparatively short distance from Liverpool, and consequently its cheapness; the ample supply that it will yield for many years; and the facilities afforded by the formation of the district for impounding the water for the supply of Liverpool in one reservoir, there being a site for such a reservoir in Bleasdale, upon the valley of the River Brock, which would, with an embankment about 110 feet high, form a reservoir of about 550 acres, containing about 3750 million gallons, or nearly as much as all the Rivington reservoirs together. The estimated cost of this scheme for say 20 million gallons of water per day is £1,679,518; or, with the additional waters which might be brought in from the head of the Wyre Valley—viz., 10 million gallons—making the total supply from the Wyre scheme 30 million gallons per day, an expense of £226,583, giving a total of £1,906,101, or say, in round numbers, two million pounds.

Such are the schemes now before the Water Committee, with respect to which they have decided to ask for further advice from Mr. Hawksley and Mr. Bateman.

In noticing the proceedings of the committee, it is impossible to pass over some remarks and a proposal made by Mr. Robertson Gladstone—a man with an essentially narrow mind, but with large ideas. Mr. Gladstone has a scheme of his own, which is to bring to Liverpool the waters of some rivers in Forfarshire and Kincardineshire, which, he says, now run to waste into the German Ocean. He foresees, however, that the cost of his scheme will be enormous, and beyond the resources of Liverpool; but he expresses his belief that it is the business of Government to provide a water supply for large towns. The more his thoughts, he said, turned to the importance of the subject, the stronger was his faith and belief that to the Government they must go; and that the Government had it in their power to carry out a scheme which would not only be beneficial to the community at large, but would be in itself remunerative. This is the last suggestion as to the duties of a "grandmotherly "Government," and it actually seems to find favour in such a city as Liverpool.

The meteorological notes published in the Quarterly Report of the Registrar-General, just issued, show that the rainfall of the past quarter at Greenwich has been less than half the average—viz., 2·4 inches instead of 5 inches. Only in one year since 1815 has the fall been so low, and that was in 1829, when the quantity measured the same as this year. The drought is general, but greater, we believe, in the south than in the north. The mean amount of rain collected at all the stations in the past quarter has been only 6¼ inches. In the corresponding quarter of last year it was 8 inches; and in 1872, 10¼ inches. At Bristol the night supply of water has been cut off in consequence of scarcity, and should the exceptional dryness continue, the results in many places will be serious.

The committee of the House of Lords, who have allowed the Nottingham Corporation to purchase the undertaking of the gas company, have refused their sanction to a compulsory purchase of the water company, and have passed the preamble of the company's Bill, limiting the maximum dividend on the new capital to 5 per cent. instead of 7 per cent. The company, however, get rid of the auction clauses contained in previous Acts. Nottingham will, unquestionably, gain by the result, for it may be taken as certain, on the authority of Mr. Hawksley, that the Corporation could not supply water so cheaply as the company. Nor could they improve the quality of the water, which is now beyond suspicion.

The opposition which towns anxious for effective drainage have to encounter from riparian proprietors is often serious, and sometimes fatal to excellent schemes. The Corporation of Swansea propose to carry the sewage of some of their outlying districts into the river Tawe, which belongs to the Duke of Beaufort. Every precaution is to be taken to prevent nuisance. The sewage is to be precipitated with lime, and filtered, before it is sent into the river; still the duke protests, and appeals to the Local Government Board. We are glad to see that Major Tulloch, the inspector sent down, lends no encouragement to the opposition, and lays it down that all the duke can require is reasonable purification. The inspector will probably report in favour of the scheme, and it will be carried out. It is easy to guess what will follow. The Court of Chancery is likely to be invoked, and Swansea will be laid under an injunction. We have no revolutionary tendencies, and have no objection to the Duke of Beaufort's "unearned increment" of rent, but it is quite time that public rights in respect of natural watercourses should be better defined than they are at present. The duke also opposes a water scheme of the Corporation of Swansea, which, his agent says, will not succeed. If it should not, we presume the loss will not be that of the Duke of Beaufort. There are, we regret to see, in the present day, noblemen who would deal with towns much as their forefathers did centuries ago, and, as before, they must be checked by the municipalities.

While objections are made to the course pursued by water companies, we are compelled to call attention to the conduct of local authorities who have the water supply in their hands. Tottenham just now affords an illustration. Years ago Tottenham was supplied on the intermittent system. Then the Local Board wisely decided on a constant service, and, at the bidding of the Board, the inhabitants altered their fittings, and took down their cisterns. But Tottenham has grown apace, while the Board have taken no steps to increase the water supply. Hence a deficiency to-day, which it it proposed to remedy in one of two ways—either a return to the intermittent system, and the replacement of cisterns capable of holding two days supply, at an estimated cost of £4 per house; or the adoption of the waste-preventing regulations proposed by the metropolitan water companies, and sanctioned by the Board of Trade, as required by the Metropolis Water Act, 1871. We are glad to see that the Board are inclined to adopt the latter course, in spite of the recommendations of their surveyor, who has been instructed to report, as early as practicable, what number of houses have water-closet taps without apparatus for preventing waste; in what houses waste takes place from defective fittings, or from other causes; and at what amount he estimates the daily preventible waste of water.

The Corporation of Leeds advertise an opportunity for sewage precipitators, who are invited to take a lease of works adapted for any system of precipitation. It is reported that they will be taken by the Phosphate Sewage Company, who have a very good clarifying process; but we do not believe in the fertilizing powers of phosphate of alumina. The works constructed at Coventry for carrying on the process of Dr. Anderson, were opened last week. This process consists in a preliminary coarse filtration, and the subsequent precipitation of the sewage by means of crude sulphate of alumina and lime. The results of the process, if carefully carried out, will, no doubt, be fairly good. The financial success of the operations of the General Sewage Manure Company, who have bought Dr. Anderson's patent, remains to be established.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

XIII.

Having traced the history of gas lighting from the commencement down to the establishment of the leading metropolitan works, and the development of the manufacture of gas into a form which, though it may be admitted not to be perfect, is now universally followed, we may pass on to a short account of the raw material from which (with a few unimportant exceptions) gas is now exclusively produced—viz., coal. This part of our subject may be advantageously disposed of by—1, a brief review of the geological conditions under which coal is found; 2, an account of the origin and formation of the deposits; and 3, a description of the varieties of coal, with their chemical and physical characteristics, with especial reference to their gas-producing qualities. A brief reference may also be made to the oil-bearing shales which are now recommended as auxiliaries in the production of gas.

Geology of Coal.

In classifying the strata of which the crust of our earth—so far as it has been revealed to our view—is made up, the geologist has formed into a distinct group, a series of layers lying, broadly speaking, between the old red sandstone below, and the new red sandstone above, to which the term, Carboniferous System, has been applied. The name has originated from the fact that, interstratified with various rocks, there occur seams of carbonaceous matter, or coal, varying, in these islands, from a quarter of an inch to several feet in thickness. For further convenience of description, the system above named has been subdivided into three other groups, the upper or true coal measures, the mountain limestone, and the lower coal measures or carboniferous slates. The reader, however, need hardly be reminded that the several strata composing the crust of the earth are not symmetrically arranged in concentric layers around the nucleus. A variety of disturbing causes, to be afterwards alluded to, have, in the lapse of ages, combined to modify the alternations of strata; and all that geology affirms is that the three groups mentioned above are present in certain localities, and constitute the characteristics of what we may call a typical coal-field.*

The most recent view of the formations which lie immediately above and below the coal measures is that stated by Mr. E. Hull, M.A., F.R.S., now director of the Geological Survey of Ireland, who has been largely concerned in the examination of the coal-fields of Great Britain. In the last edition of his work on the "Coal-Fields of Great Britain"† (p. 80), the author gives a tripartite division of the coal measures of England and Wales, applicable, he believes, to the whole of Britain, which, though not as yet generally recognized, is rendered, he says, more probable by every day's experience.

Tabular View of the Trias, Permian, and Carboniferous Series in England and Wales.

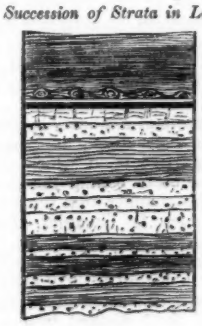
New red sandstone or trias	Keuper	Red marl. Lower Keuper sandstone.
	Bunter	Upper mottled sandstone. Conglomerate beds. Lower mottled sandstone.
Permian rocks		Upper red sandstone of St. Bees, &c. Upper and lower magnesian limestones and marls of the northern counties. Lower red sandstone of Lancashire, Cumberland, and Yorkshire, &c. (on the same horizon with) Red sandstones, marls, conglomerates, &c., of central counties and Salop.
Carboniferous rocks.	Upper carboniferous	Upper coal measures with limestone, and thin coal seams. Middle coal measures with thick coal seams.
	Lower carboniferous	Lower coal measures, or Gannisten series, with thin coal seams. Millstone grit with thin coal seams. Upper limestone shale, or Yoredale rocks. Carboniferous limestone with shales, sandstones, and coal in the northern counties and Scotland. Lower limestone shale.

Old red sandstone or Devonian rocks.

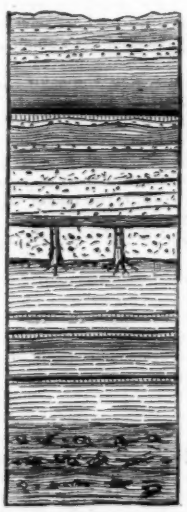
The arrangement of strata here stated is not, however, invariable; it applies specially to the districts in the north of England where the mountain limestone and shales rest immediately on the old red sandstone, and carboniferous slates are absent. In some districts, as in South Staffordshire, carboniferous limestone and millstone grit are absent, and the coal formations rest on the upper Silurian rocks. In Ireland the carboniferous slates are enormously developed, having in places a thickness of from 700 to 1200 feet. In other countries both slates and limestone are absent, and the coal reposes directly on the igneous or crystalline rocks.

A section, which we borrow from the work of Mr. Hull above referred to, will give the reader a better idea of the succession of strata which accompany coal, than a merely verbal description.

Succession of Strata in Lower Coal-Measures, near Wigan, Lancashire.



Black shales.
Shales.
Coal, Bullion seam.
Underclay.
Sandstone.
Micaceous shale.
Flaggy, rippled sandstone.
Micaceous flags and shales.



Strong sandy shale, &c.
Grey shale.
Coal, 16 inches thick; Gannister seam.
Clay and hard Gannister.
Shales and flags.
Micaceous sandstone.
Shale.
Sandstone, with upright stems of sigillaria.
Tough shale, with bands of ironstone.
Dark shales, with nodules of ironstone.

The coal measures are, in fact, made up of deposits of shales, clay, and sandstone, with occasional seams of coal, and in many localities bands of ironstone. The layers of coal bear but a small proportion to the intercalated strata. In Fifeshire, for example, the coal measures which furnish some of our best gas coals, have a total thickness of upwards of 4000 feet, while the seams of coal, 29 in number, have only an aggregate thickness of 120 feet.

As we are not writing a treatise on geology, the above will suffice for a general view of the coal deposits of the true carboniferous era. It must be mentioned, however, that there are a few seams of coal in the oolitic system, a more recent formation than the true carboniferous rocks. One of these is the Kimmeridge coal, which has been worked to some extent. Another deposit of coal in the great oolite is found at Gristhorpe, in Yorkshire, and has also been worked. A more important deposit in the oolite exists at Brora, in Sutherlandshire, where it has been mined extensively for more than a century. "One seam of good quality has been worked, 3½ feet thick, and there are several feet more of pyritous coal

* Page. "Advanced Text Book," p. 137, Ed. 1856.

† To this able and exhaustive work, we may at once refer any reader who is anxious to obtain a full and accurate knowledge of the coal resources of Great Britain, and indeed of all other parts of the world, so far as they are at present known.

resting upon it."* Coal is found in the same system in Germany and the East Indies; but the most important coal-field in the oolite is that of Richmond, Virginia, U.S., where the main seam of pure bituminous coal, equal in quality to the best Newcastle, is from 30 to 40 feet in thickness.

Communicated Article.

SIEMENS' AND ANALOGOUS HEATING SYSTEMS, AS EMPLOYED AT THE GAS-WORKS OF PARIS.

(FROM OUR PARIS CORRESPONDENT.)

It is well known that, by the ordinary method of heating retorts in the gas-house, only a portion of the heat afforded by the coal or coke is utilized, and that the gaseous products of combustion leave the furnace at a temperature sufficiently elevated as to arrive at from 800° to 1200° at the base of the chimney. Various attempts have been made to utilize a portion of this waste heat, and to produce an economy of fuel, which have been more or less important. Siemens has solved this problem, in a general manner, by an invention which is at once simple and ingenious. His method was published in patents obtained in London, dated Jan. 22 and July 19, 1861, and was described in the following manner:—Instead of burning the coke directly in the furnace used for heating purposes, it is changed previously into the condition of combustible gases, and such are then ignited under the retorts, with the admission of the necessary quantity of atmospheric air, already heated by previously used fuel or gases at the exit of the furnace, which, consequently, increases the temperature at which combustion takes place. Two special arrangements are adopted, one called the "generator," where the coke is converted into combustible gases, and the other is called the "regenerator of heat," in which is retained the heat commonly lost by the passage of flame into the main chimney, but now used to heat up the combustible gas and air previously to their entrance into the furnace holding the retorts. This plan of Siemens' furnace has been experimentally tried at the works of the Parisian Gas Company since August, 1862, and, after numerous experiments and modifications, it has worked regularly since 1864 at the works of Vaugirard, and, since 1869, at the works of St. Mandé, places in which circumstances rendered necessary the erection of two rows or stages of furnaces one over the other.

In the first of these works the two generators of combustible gases feed two benches, each with 16 ovens. These generators are placed in the space which separates the two departments in which carbonizing takes place, one in front and the other behind the chief chimney common to both benches, in such a manner that the combustible gases can only arrive at the apparatus for changing their work after being properly cooled by a passage through about 75 mètres (82 yards) of iron-plate piping connecting the generator with the distributor. These generators, fixed at a height of 3·70 mètres (12 feet) under the level of the spaces, are constructed of a solid mass 5·50 mètres (18 feet) by 9 mètres (29½ feet), divided into two chambers, which end at their lower part by furnace-bars placed at an angle of 45°, and which, separated by an intermediate partition, present a linear extent of 10 mètres (10·936 yards) for each generator. Each of the furnace-beds is composed of four bars, placed at an interval each of 8 centimètres (3½ inches), on which the coke which it is intended to convert into combustible gases is placed, to the thickness of from 80 centimètres to 1 mètre (say from 32 to 39 inches). At the upper part of these chambers, which are at the level of the bottom of the spaces, there are orifices by which the charge of broken coke —the only fuel used—is introduced. Each of these sets of apparatus is surmounted by a chimney a few mètres in height, the end of which is connected by a system of horizontal and vertical pipes, with a distributor made of iron plate, placed at the foot of the ovens throughout the entire length of each bench.

The "regenerators" are placed immediately under the ovens, between the distributing-pipe, by which the gases arrive, and the point at which the combustion actually takes place. They are each composed of two equal-sized chambers, filled with fire-brick, arranged so as to form cells or divisions by vertical partitions in two equal-sized compartments; one is intended for the arrival of the combustible gases, and the other for the admission of the air necessary for combustion. These chambers, which freely communicate at their upper part, by several openings, with the interior of the oven, can be readily put into communication by their lower part, by means of a system of registers, equally with the distributor of the gases and air and the main chimney, in such a manner that it is always easy, when the combustible gases and air pass by one of the chambers to reach the oven where they ought to burn, to force the products of combustion to travel by the other to reach the chimney. When the gas generator is lighted below, the carbonic acid gas, as a product of the combustion, cannot reach the chimney, except by traversing a certain thickness of coke which is at a dull red heat; it is consequently converted into carbonic oxide. Water, introduced in a fine stream on the furnace to cool it, is changed into steam, and, being decomposed, produces hydrogen and oxygen, which latter, passing over the incandescent coke, produces rapidly carbonic oxide.

It therefore happens that at the upper part of the generator, independently of nitrogen arising from the air introduced, certain combustible gases—carbonic oxide, hydrogen, and carburetted hydrogen —are produced, all capable of affording heat by their combustion with atmospheric air. From the generator, the combustible gases reach the distributor, and thence pass into the regenerating chamber; and while they rise towards the oven, they traverse the brick chambers in one compartment, or, by means of the other, they meet with the atmospheric air essential for their combustion. However, on entering into the oven, the combustible gases catch fire, produce carbonic acid, and, in the presence of the steam, give rise to great heat; and the products of combustion, after having circulated around the retorts, escape from the oven in passing by the second chamber of the regenerator, which they traverse throughout its height. There the flame, crossed by brick cells, is filtered from its heat, and the gases, when the regenerators are properly arranged, pass into the chimney at a comparatively low temperature.

If it be desired to reverse the direction of the flame, so as to allow the combustible gases and air to arrive by the chamber of the regenerator, conducting the products of combustion of the oven to the chimney, and reciprocally the gases and air passing across the strongly-heated brick cells, they retake the heat which is there accumulated in such a manner that when they arrive at the entrance of the oven they will have acquired a temperature of from 1000° to 1200°, or even more. This temperature is, therefore, in addition to that which would arise from the combustion of the carbonic oxide and the hydrogen, and it is evident that by such means the heat due from any quantity of the combustible employed will be proportionately increased in economical value.

Thus while one of the chambers of the regenerator is in process of cooling, in giving its heat to the combustible gases, the other is becoming heated by being in contact with the products of combustion. It is thus at all times easy, by reversing the direction of the flame by means of registers, to regulate the temperature both of the gases and of the oven within any desired limits. After that, time is given to allow the chamber of the regenerator through which the combustible gases pass to cool—that is, the more frequent the reversal of the direction of the flame, the greater the elevation of the temperature of the gases, the greater will be the intensity of the developed heat, and the greater the economy in preventing waste of heat. The Siemens furnace should, therefore, be the more economical in use according to the height of temperature employed. Hence the reason that it has so rapidly extended in employment at glass, iron, steel, and other works. It is estimated that in such works, and others requiring an excessively high temperature, the Siemens system is capable of realizing a saving of from 40 to 50 per cent.; but in gas-works, where the consideration of special matters is involved, the economy has not been so great, and this has been the experience of the last few years at the Vaugirard works at Paris.

For a long time the generators placed in the spaces were not sufficient to maintain more than seven double ovens; but, thanks to the exertions of the manager of those works, and perhaps also to his system called "anti-refrigerant," added to the furnace, as already described in your issue of March 10 (page 322), and which prevents the loss of heat by radiation from the front of the furnace, they now heat in a regular manner 16 ovens, each containing eight retorts; that is in all 128 retorts ⌂ shape, 2·6 mètres (8½ feet) in length, 0·640 mètre (2·1 feet) in breadth, and 0·350 mètre (1·15 feet) in height.

The results obtained have been as follows*:—

Consumption of Coke per Ton of Coal carbonized.

In the ordinary double-staged ovens . .	5·80 hectolitres.
In the double-staged ovens heated by the Siemens system	4·60 „

With this estimate of coke, in volume, must, however, be borne in mind the circumstance that in ordinary ovens coke taken direct from the furnace is used, weighing at the rate of 40 kilogrammes (88·2 lbs.) per hectolitre (3·53 cubic feet), while in the Siemens generators the broken coke burned weighs at the rate of 45 kilogrammes (99¼ lbs.) per hectolitre. In calculating, therefore, the respective weights, it follows that there is an economy of fuel at the rate of 12 per cent. in favour of the Siemens plan compared with the ordinary double-stage furnaces, in place of 20 per cent. in respect to volume. It is probable that whichever mode of heating is employed, the economy obtained is compensated in keeping clear the pipes, leading to the middle retorts, and the maintenance of the joints of the masonry of the regenerators, so as to prevent the accidental admission of unnecessary atmospheric air.

In respect to maintenance of the ovens, an important advantage has been discovered in respect to the Siemens system. The retorts, although not so well supported as in the ordinary ovens, yet resist longer the action of the flame to which they are subjected; they are not liable to collect cinders, which, with other causes, tend in the ordinary ovens to hasten their destruction. It has been found at Vaugirard that the same retorts have lasted 712 days work, and that each retort is capable of carbonizing 600 tons of coal before it becomes useless. The maintenance of the generators is but of little expense; the furnace-bars require periodical renewal, but the masonry at Vaugirard has not required repair since the ovens were first put to work in 1864. The regenerators are repaired at the same time that the retorts are changed, and many of the fire-bricks taken from the chambers may be used again.

Having established the fact that the Siemens system of heating the ovens at present is only applied at works where several stages are in operation, it remains to examine the double question of what economy would result in its employment in special works, and, on the other side, as to whether there is any advantage in constructing works specially for the purpose of applying the Siemens plan. The fol-

* Lyell. "Elements of Geology," 6th Ed., p. 498.

* By employing the "anti-refrigerant" system of M. Letreust, the following results were obtained:—

Consumption of Coke per Ton of Coal carbonized.

In the ordinary double-staged ovens	5·20 hectolitres.
In the Siemens ovens	4·00 „

lowing comparative statements answer the first question. The cost of erecting the double stage ovens at Vaugirard, including walls, plant, &c., and, on the other part, of Siemens' generators and regenerators, per retort, was—

For two-stage ovens . . . . . 2000 francs, or £ 80
" " " with Siemens' system . 2550 " " 102*

The maximum of coal carbonized per retort is 900 kilogrammes (17¾ cwt.) per 24 hours, and, at present, with 200 ovens in effective work by the year, the amount of coal carbonized per retort is 180 tons. The coke consumed for carbonizing this quantity is 5·80 hectolitres per ton, or 1044 hectolitres, which costs about 1·20 francs per hectolitre, or an annual cost of 1253 francs (say, £50). Siemens' plan gives a saving of 12 per cent. on the consumption of fuel, and this is at the rate per retort annually of 150 francs (say, £6). If, however, interest at the rate of 7 per cent. be charged on the outlay, the difference of price between the ordinary and Siemens system—that is, 550 francs (£22), giving for interest, &c., 38·5 francs—it is found that an actual saving of 111·50 francs (say, £4 10s.) is effected, which, taking into account the annual consumption of coke, would effect an actual saving of about 9 per cent. in favour of the system of Siemens.

In comparing the stage works, not heated by Siemens' system, with the ordinary ones level with the ground, it appears that the expense of heating per ton of coal carbonized is a mean of 5·24 hectolitres in works of the latter class, as at La Vilette, Passy, and Les Ternes, while in those which have two stages, as at Vaugirard and St. Mandé, this expense varied from 5·80 to 6·00 hectolitres, with a mean of 5·90 or about 11 per cent.

This difference is considerable if it is remarked, in effect, that one retort carbonizes about 900 kilogrammes per day, and allowing 200 working days, the work would be 180 tons per annum; and, with the present price of coke at 1·20 francs per hectolitre, it will be found that the extra expense due to the employment of the stage system will be annually 120 francs (£4 16s.) per retort, a sum which should be added to the difference of price of erecting the stage ovens and the ordinary kind, which is the difference between 2000 francs (£80) and 1200 (£48)—that is, about 800 francs (£32) per retort. In adding, then, the 120 francs (£4 16s.) to the interest at 7 per cent. of the difference of price of erection—that is, 56 francs—an extra annual expense per retort of 176 francs (£7) is arrived at, which, added to the value of the coke employed for carbonization—that is, 180 tons of coal at 5·24 hectolitres, equalling 943 hectolitres at 1·20 francs, giving a total of 1132 francs (say, £45 5s.), shows an actual increase of expense of 15½ per cent. between the stage-ovens and those of the ordinary kind level with the ground.

The substitution of the double-stage system for the ordinary kind, far from presenting any advantages, has been much more troublesome and expensive than has been shown in the preceding comparative calculations, as no account has been taken of the expense of supporting walls and various other items incidental to that system, and it consequently appears that very little economy results in the adoption of that plan.

It now remains to determine the relation which exists between the ordinary arrangement, and of the stage system having the ovens heated by the Siemens plan. The cost of erecting a retort in the ordinary oven being 1200 francs (£48), and in those of Siemens 2550 francs (£102), the difference per retort is 1350 francs (£54). On the other side, the expense of heating per ton of coal carbonized is, as a mean for the ordinary kind, 5·24 hectolitres, and for the Siemens it is 4·60 hectolitres. The economy resulting from the application of Siemens' system is, then, 0·64 hectolitre per ton of coal carbonized. The quantity of coal carbonized annually per retort being, at a maximum, 180 tons, the saving effected by the Siemens system is 154 hectolitres of coke, at 1·20 franc, or 185 francs (say, £7 10s). But, charging interest at the rate of 7 per cent. on the diffence of capital required—that is, 1350 francs (£54), which gives 95 francs (£3 16s.) for interest—it will be found that there is a saving of but 90 francs (£3 12s.) in the total expense of fuel, which, for 1132 francs (say, £45), gives only a saving of 8 per cent. between the Siemens and ordinary level system.

But this economy is only apparent, for, taking into account the difference of the weight of coke employed in the ordinary ovens and of the broken coke used in the Siemens generators, it is almost impossible to assign an appreciable difference in the comparative cost. The different works do not always use the same kind of coal, and, far from achieving any benefit by employing Siemens' plan, they sustain a considerable loss in fuel by substituting, in place of the level setting system, the double stage with Siemens' ovens.

It therefore appears, in regard to the Siemens system, that it cannot be employed in an advantageous manner except in the case where the peculiar conditions of a gas-work make a preference of the double-stage plan necessary, which becomes much dearer than the ordinary plan, in which the ovens are exposed to loss by cooling, amounting to 11 per cent. or more of the fuel employed.

In applying the Siemens system in the works of St. Mandé, where the double-stage plan prevails, recourse was had to a plan experimented on at the Vaugirard works—namely, in place of setting the generators near the bench, which would involve much space, each occupying a surface of 130 square mètres—say, 156 square yards—the generator was placed by each double oven, at the foot of them, thus causing but little alteration in the previous arrangements. In this apparatus the furnace-grate has a length of 1·60 mètres (4¼ feet). This new method has the advantage of allowing the passage of the combustible gases to the regenerator with a temperature estimated at 600°, and it avoids the difficulties of uniform distribution of the gases by the pipe placed formerly along the entire length of the bench. In working these ovens, it has already been found that a saving of fuel is effected in making the flame pass out solely over the air-chambers, instead of those of gas and air. This change has reduced the consumption of coke per ton of coal carbonized to 4·20 hectolitres.

The results obtained at these works nearly approach those of the Vaugirard works. The coke burned at St. Mandé per ton of coal carbonized amounted in the ordinary ovens, in two stages, to 5·95 hectolitres, and under the Siemens plan to 4·40 hectolitres.

Since the erection of the Siemens ovens in the works of the Parisian Company, several engineers have attempted new plans to obtain a more complete combustion of the gases, and a more entire absorption of the previously lost heat. Among the various plans that have been tried, the following may be named:—

The Ponsard System.—This system depends on the idea that in place of heating, as in the Siemens ovens, the gases of the generator, and the necessary quantity of air for combustion, the air only is heated, but not by altering the direction of the flame by means of registers, but in making the intended air to aid combustion, circulate in an apparatus called a "recuperator," which is a chamber of hollow bricks, arranged in such a manner that the products of the combustion of the oven traverse it in one direction on their road to the chimney, while the air circulates in an opposite direction among the retorts, thus absorbing the heat from the burning gases as they escape. The recuperators are arranged in a manner analogous to that of Siemens' regenerators, at the bottom of the gas-ovens. The result did not prove to be of any benefit beyond Siemens' plan; the construction and maintenance of the recuperators were very delicate, for the least fissure allowed the mixture of the burning gases with the air, thus lowering the draught at the gas-ovens.

The Lencauchez System.—This consists in employing a recuperator, constructed on similar principles to the preceding. This partly resembles the *calorifère* of Messrs. Gaillard and Maillot; but instead of being constructed of hollow bricks, which too frequently occasion a communication between the air and the smoke, it consists of an arrangement of horizontal and vertical pipes made of earthenware. Beside this system of heating, M. Lencauchez has improved the chambers where combustion of the gases takes place, which arrive here by means of conical and convergent channels or orifices—the gas at the lower part and the air at the sides—in place of the Siemens plan, in which the combustible gases ascend by the side of the air. By this plan the mixture of the gases and air can be so regulated as only to have about 2½ per cent. of oxygen as they escape into the chimney. The inconvenience of this system is the intense heat too concentratedly directed to the upper part of the furnace, so that the lower retorts of the oven are rapidly injured, while the other parts of the oven receive insufficient heat. The advantages of economy of the system are but triflingly superior to those of Siemens.

The study of the interesting question is far from being exhausted. It remains to solve the difficult problem of the application of heat produced by combustible gases, and of the system of regeneration of heat to ordinary ovens without constructing them in two stages.

Messrs. Muller and Eichelbrenner have, during the last two years, erected in several small country town gas-works, a system of heating of which we purpose giving a description in detail hereafter. We understand that the engineer-in-chief of the Parisian Company purposes to construct an oven with vertical retorts, which it is hoped will give all the advantages of Siemens' plan without the construction of double stages, necessary in that system.

* The erection of the ovens and plant alone, without including the walls, per retort, cost—
Ordinary double-stage ovens . . . . . 720 francs, or £28 16s.
Siemens' ovens . . . . . 1260 " " 50 8

Correspondence.

GAS PURIFICATION.

SIR,—Mr. F. J. Evans does not relish my statement that all the reports of the gas referees were "prepared by myself." But I cannot speak otherwise—it is simply the fact. Moreover, in answer to your remark, I now beg to say that I use the word "*prepared*" in the very widest sense, and not merely as equivalent to writing or composing the reports. What does Mr. Evans know on the subject? As stated in this JOURNAL, in the joint letter of Mr. Peirce and myself, dated Oct 8. 1872, with the exception of the short report on the standard burner, every one of the reports associated with the name of the gas referees was issued after Mr. Evans had ceased to be one of us. If Dr. Pole objects to my statement as to the authorship of the reports—which I am sure he will not do—certainly he can do so for himself, without any prompting from Mr. Evans.

The production of these reports, as Mr. Evans knows perfectly well, was not required of the referees, and the long labour given to such work was entirely gratuitous. Your readers may ascertain this by looking at the Acts of Parliament of 1868 and 1869, and they will also find the case so stated in the definition of the referees duties which the Board of Trade published in 1872. During my four years of office, I gave my whole time, besides discharging my duties, to the difficulties connected with gas purification, amply content with the approval which the gas world bestowed upon these reports.

Since Mr. Evans insinuates, if he does not openly allege, that there was some underhand procedure connected with my patent, I may state that, so far from observing the customary reticence on such matters, I told Mr. G. Trewby of my intention before the preliminary specification was filed; and on the first clear day after the filing, I called upon Mr. Phillips, secretary to the Chartered Company, and *showed him the actual specification;* as I likewise also did on the same day to Mr. Livesey, of the South Metropolitan Company; and on the Friday following I described my patent to Mr. Evans and other officers of the Chartered Company assembled at Horseferry Road. In fact, no one could possibly have been more frank and ingenuous than I was. The only

question at that time among the secretaries and gas engineers was, "*Will it do?*"—Mr. Evans holding strongly that it would not, and also that the cause of the unparalleled failure at Beckton was, to use his own words, "all in the coals."

As I do not wish to say more than has been made imperative on me by Mr. Evans's letter, I stop here. But should my late colleague desire it, I will be happy to explain the mighty change which came over his sentiments and conduct after the publication of our report on the Beckton works.

R. H. PATTERSON.

21, *John Street, Adelphi, W.C., London, May* 7, 1874.

TUNBRIDGE WELLS GAS BILL.

SIR,—On reading your report, to-day, of the evidence which I gave in this matter, I observe several inaccuracies, which render my statements unintelligible.

What I stated was that, in my opinion, five years was the limit of the capacity of the existing works; that in that time £10,000 would have to be spent, and, as new works would then have to be erected elsewhere, that this money would have been wastefully sunk.

That the leakage, instead of having been 10 per cent., as reported, has been more than 20 per cent.—22 per cent., indeed, on the average of the last three years—and by delivering gas from the proposed new works at an initial pressure of 6-10ths, instead of at 24-10ths, as now, from the old works, the saving in leakage will exceed 10 per cent.

R. P. SPICE.

21, *Parliament Street, Westminster, S.W., May* 9, 1874.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MAY 4, 1874.

WESTLEIGH, PENNINGTON, AND BEDFORD LOCAL BOARDS BILL.—Report from the Select Committee, that the committee had not proceeded with the consideration of the Bill, no parties having appeared in opposition thereto, read; Bill committed for Tuesday, May 5.

HARTLEPOOL GAS AND WATER BILL.—Report from the Select Committee, that the committee had not proceeded with the consideration of the Bill, the opposition thereto having been withdrawn, read; Bill committed for Thursday, May 7.

GAS AND WATER ORDERS CONFIRMATION BILL.—A Bill for confirming certain Provisional Orders made by the Board of Trade under the Gas and Water Works Facilities Act, 1870, relating to Braintree and Bocking Gas, Brough Elloughton and District Gas, Chelmsford Gas, Dartford Gas, Guildford Gas, Harwich Gas, Lofthouse and District Gas, Retford Gas, Romford Gas, Sidmouth Gas, Sutton-in-Ashfield Gas, High Wycombe Water, Inverness Gas and Water, Maidstone Water, was presented by Lord Dunmow, read a first time, and referred to the Examiners.

TUESDAY, MAY 5.

ENNISKILLEN GAS BILL.—Reported from the Select Committee, with amendments.

The Fairfield Local Board, and Westleigh, Pennington, and Bedford Local Boards Bills, were reported, with amendments.

The Airdrie and Coatbridge Water Bill, brought from the Commons, was read a first time, and referred to the Examiners.

THURSDAY, MAY 7.

The Nottingham Gas and Water, Nottingham Water, Ystrad Gas and Water, and Middlesborough Extension and Improvement Bills, were reported from the Select Committees, with amendments.

The Hartlepool Gas and Water and Llanelly Gas Bills were reported, with amendments.

Petitions against the Alliance and Dublin Consumers Gas Bill were presented from (1) Chamber of Commerce, (2) consumers of gas in Dublin, &c.

FRIDAY, MAY 8.

ALLIANCE AND DUBLIN CONSUMERS GAS BILL.—Reported from the Select Committee, with amendments.

The Enniskillen Gas, Fairfield Local Board, and Westleigh, Pennington, and Bedford Local Boards Bills, were read a third time, and passed.

The Lord Chancellor acquainted the House that no further Standing Orders are applicable to the Airdrie and Coatbridge Water Bill.

GAS AND WATER ORDERS CONFIRMATION BILL.—To be read a second time on Monday, May 11.

HOUSE OF COMMONS.

MONDAY, MAY 4, 1874.

A petition for additional provision in the Cupar Water Bill was referred to the Examiner of Petitions for Private Bills.

The Airdrie and Coatbridge Water Bill was read a third time and passed.

MUNICIPAL CORPORATIONS (BOROUGH FUNDS) ACT, 1872.—A petition for alteration was presented from Exeter.

The Leeds Corporation Water, &c., and Wrexham Water Bills (Lords) were read a first time and referred to the Examiner of Petitions for Private Bills.

POLLUTED WATER.

Mr. BROWN asked the President of the Local Government Board whether there was any power in the hands of any rural sanitary authority to close, or prevent the inhabitants of such sanitary district from using the water from any wells or streams, when they were found by the Medical Officer of Health or Inspector of Nuisances to be polluted by sewage or other deleterious matter.

Mr. SCLATER-BOOTH: In the case of wells or water supplies of a public character, it is in the power of the sanitary authority to prevent the use of polluted water, but in the case of private wells there is no such power. This, with many other points arising under the Sanitary Acts, has been recently under my consideration, with a view to some amendment of the law, and I hope shortly to be able to make some proposals on the subject.

TUESDAY, MAY 5.

The Neath Corporation Bill (Lords) was read a first time, and referred to the Examiner of Petitions for Private Bills.

The Aberdare and Aberaman Gas, Grantham Gas, Hythe Improvement and Water, and Ulverston Local Board Bills, were reported.

GAS ORDERS CONFIRMATION BILL (Lords).—Read a first time; to be read a second time upon Thursday, May 7.

METROPOLIS WATER SUPPLY AND FIRE PREVENTION BILL.—Second reading deferred till Friday, May 22.

WEDNESDAY, MAY 6.

TUNBRIDGE WELLS GAS BILL.—As amended, considered; amendments made; Bill to be read the third time.

A petition in favour of the Edinburgh and District Water Bill was presented from the Provost, Magistrates, and Council of Portobello.

THURSDAY, MAY 7.

LEEDS CORPORATION WATER, &C., BILL (Lords).—Report, that no Standing Orders not previously inquired into are applicable, laid upon the table; Bill to be read a second time.

MUNICIPAL CORPORATIONS (BOROUGH FUNDS) ACT, 1872.—Petitions for alteration were presented from Wigan and Cardiff.

The Belfast Corporation Gas Bill was reported.

GAS ORDERS CONFIRMATION BILL (Lords).—Read a second time, and committed for Monday, May 18.

Requisitions to withdraw petitions against the following Bills were lodged:—Belfast Water, from (1) inhabitants of Carrickfergus, (2) Barry Martin Smyth; Dublin Corporation Water, from Great Southern and Western Railway Company.

The Dundee Water, Edinburgh and District Water, Musselburgh and Dalkeith Water, and Mid-Lothian Water Bills, were referred to a Select Committee, consisting of Mr. Knight (chairman), Mr. Freshfield, Mr. Davies, and Mr. Wilson, to meet on Tuesday, May 12, at twelve o'clock.

The Belfast Water, Dublin Corporation Water, and Waterford Gas Bills, were referred to a Select Committee, consisting of Mr. Ellice (chairman), Colonel Dyott, Mr. Bruce, and the Marquis of Stafford, to meet on Thursday, May 14, at twelve o'clock.

FRIDAY, MAY 8.

LYMM WATER BILL.—As amended, considered; to be read the third time.

WREXHAM WATER BILL (Lords).—Report, that no Standing Orders not previously inquired into are applicable, laid upon the table; Bill to be read a second time.

CUPAR WATER BILL.—Report, on petition for additional provision, that the Standing Orders have been complied with, laid upon the table; instruction to the committee on the Bill that they have power to make provision therein accordingly.

MUNICIPAL CORPORATIONS (BOROUGH FUNDS) ACT, 1872.—A petition for alteration was presented from Leeds.

A petition in favour of the Edinburgh and District Water Bill was presented from the Provost, Magistrates, and Council of Leith.

The *locus standi* of the following petitioners against the Edinburgh and District Water Bill has been disallowed:—(1) Mid-Lothian Water Company (except as against clauses 24 and 29, and so much of the preamble as relates thereto, and except as to the petitioner, R. B. W. Ramsey), (2) Edinburgh and Leith Wine, Spirit, and Beer Trade Association, and others (except as against clauses 25, 29, 30, 49, and 50, and so much of the preamble as relates thereto), (3) Caledonian Railway Company (except as against clauses 25, 29, 49, 50, and 59, and so much of the preamble as relates thereto), (4) ratepayers within the limits of supply of the Edinburgh and District Water Trust (except as against clauses 57 and 58, and so much of the preamble as relates thereto), (5) Trustees and Local Authority of Dalkeith.

LOCAL AUTHORITIES AND WATER SUPPLY.

Mr. WHALLEY asked whether the Local Government Board is prepared, if duly requested by local authorities, to afford the aid of Government, through the agency of the Board of Health or otherwise, to obtain reliable information and promote arrangements for a better supply of water in those cases where it may be expedient to combine several towns or districts under one comprehensive system of water supply.

Mr. SCLATER-BOOTH: Yes, sir. The Local Government Board is empowered, by the 26th section of the Public Board of Health Act, to combine several sanitary districts into one district, for the purpose of procuring a common water supply. In the event of their wishing to do so, the Local Government Board is happy to give every information and assistance in their power, and promote the object as far as it can.

HOUSE OF LORDS.

MONDAY, APRIL 27.

(*Before Lord* HANMER, *Chairman; Viscount* CANTERBURY, *Lord* FOXFORD, *Lord* ANNALY, *and Lord* WAVENEY.)

NEATH CORPORATION BILL.

The consideration of this bill, which had been postponed from the 23rd of April, was this day resumed.

Mr. MICHAEL said he understood the committee on the previous Friday to say that they required the compulsory clause to purchase the water-works to be struck out, if the company provided certain improvements for supplying water within a given time, and that there should be a price mentioned in the bill as the price which was to be given for the undertaking.

The CHAIRMAN: That is so.

Mr. MICHAEL said the corporation were prepared to give £27,000 for the whole of the water-works. The basis upon which that sum was fixed was this: the corporation offered 25 years purchase of any dividend in any one year. That would amount to £20,000 for the Neath undertaking, and £7000 for the Briton Ferry undertaking.

Sir MORDAUNT WELLS said he would call before their lordships witnesses to prove the financial position of the water company, and their ability to give an adequate supply of water to Neath.

Mr. *Thomas Hawksley*, C.E., was called by Sir MORDAUNT WELLS, and said he had been consulted by the Neath Water-Works Company. The capacity for storeage in the reservoirs was 22 million gallons—viz., 18,500,000 gallons at the Neath works, and 3,500,000 at Briton Ferry. The population of Neath was 11,000. The system of constant supply was adopted at Neath. Taking the present population and the present capacity for storeage, there was an ample supply, providing Reservoir C on the plans was utilized. The drainage area was 1410 acres, and 720, as had been stated before the committee. There would be not the slightest difficulty in filtering the water. He understood the company were willing to filter the water, and it could be done at a cost of £2000. The company had told him that they were prepared to enlarge their reservoirs from time to time in order to keep the supply ahead of the demand. Twenty-five years purchase was the least price which in his opinion ought to be paid for the works. That would be 25 years purchase upon £1000 a year.

Mr. MICHAEL: We offered £27,000 for the undertaking and £3000 for the money which had been expended on the works by the company, making a total of £30,000.

Viscount CANTERBURY: Then the committee are of opinion that the corporation offer more than this witness values the undertaking at.

Witness said the £1000 a year came from Neath alone. There was also the Briton Ferry works to be taken into consideration, which, although at present had realized no profit, undoubtedly would in the course of a few years.

After a long discussion, the room was cleared whilst the committee deliberated. On the readmission of the public,

The CHAIRMAN said the committee were of opinion that the time had not arrived for the compulsory sale of the water-works to the corporation. They were, however, of opinion that the condition of the existing water supply was not satisfactory.

Mr. THOMAS, on behalf of the owners of the Knowle estate, objected to the clauses of the bill rating his clients for the gas when they would derive no advantage from it.

Mr. WILBERFORCE, for the Great Western Railway Company, objected to the company being rated for the borough rates.

Mr. MICHAEL could not see any reason why the railway should not be rated.

The company virtually asked their lordships to alter the public legislation on the subject.

A long conversation arose on the subject, and ultimately

The CHAIRMAN said the committee were of opinion that the rates for gas purposes should be levied in accordance with the provisions of the Local Government Act as regarded the incidence of the rates.

Mr. MICHAEL said the decision of the committee would alter the public legislation.

Viscount CANTERBURY said the effect of the decision would be to leave things as they were.

Mr. WILBERFORCE hoped they were not going to include the railway company.

Viscount CANTERBURY said they had not been included in the decision of the court.

Mr. MICHAEL said a railway company received great advantages from lighting, and therefore they ought to be rated. He drew up a clause assessing the owners of certain kinds of property at one-fourth of its annual value, and submitted it to the committee.

Mr. WILBERFORCE asked the committee to include railways in the clause.

Mr. MICHAEL objected.

Viscount CANTERBURY: Why do you not accept the clause in the general Act?

Mr. MICHAEL: Because that would include railways.

The CHAIRMAN: The committee are of opinion that the clause of the Local Government Act should be inserted.

The clauses were then gone through and agreed to, and the chairman was ordered to report the bill, as amended, to the House.

MONDAY, MAY 4.

(*Before Lord* MONTEAGLE, *Chairman; Lord* AMHERST, *Lord* TEMPLEMORE, *Lord* DE VESCI, *and Lord* LYVEDEN.)

ENNISKILLEN GAS.

Mr. DENISON, Q.C., and Mr. RICHARDS, Q.C., appeared for the promoters, and Mr. STEPHENS for the Commissioners of Enniskillen, who opposed the bill.

Mr. DENISON explained the object of the bill, which was to enable the existing gas-works, which were at present private property, to be handed over to a public company. The works had been constructed on property leased from the Commissioners of Enniskillen, to whom a nominal rent was paid, but it was now proposed to acquire the freehold at its full value. Of late years it has been considered inconvenient and undesirable that works for the supplying of a town with gas should be in the hands of private individuals. It was deemed preferable that they be in the hands of a public company, and under parliamentary control. Parliament had invariably refused to sanction a competing scheme on the part of a public body, unless ample provision was made for compensating the owners of any existing works; therefore, if the commissioners supposed that, by throwing out this bill, they would be any nearer to getting the supply into their own hands, they were much mistaken. Of course, the commissioners found fault with the price which it was proposed to charge for the gas; but, in a small town in Ireland, it could not be expected that the same price could be charged as in a large town in England. In Enniskillen the price was 7s. 6d. per 1000, in Strabane 7s. 6d., and in Sligo it was 7s. 6d. It was proposed by the present bill to limit the dividend to 10 per cent. upon the capital, and this would give the public a proper control over the price. One of the objections urged by the commissioners was that the members of the proposed committee were not citizens of the town, but the truth was that the Corporation of Enniskillen had shown no interest in the matter. They also complained that the maximum price proposed by the bill was 8s. 6d. per 1000, but they did not say that the charge hitherto had been too much.

Mr. G. D. Malam, gas engineer, was examined, and stated that his father held the original lease for gas purposes in Enniskillen. The lease had now about 34 years to run, at a nominal rent. At the time the petition was presented Mr. H. Brothers had an interest in the lease, but his interest had now ceased. The gas-works were well situated, close to the lough and railway, were in good order, and capable of furnishing Enniskillen with an efficient supply of gas for years to come. The quality of the gas was fixed at 14 candles. The proposed capital was £16,000, divided into 1600 shares of £10 each. That capital was ample without being excessive. In 1872 the profits from the gas-works were £702, and in 1873 £650. The profits had been to some extent affected by the rise in the price of coal. The charge to the commissioners for the public lamps was 5s. 6d. per 1000 feet, and 7s. 6d. to private consumers. Some complaints had been made as to the price of the gas, but only in very special cases.

Some other evidence was heard, and ultimately the committee passed the preamble of the bill, but reserved power to the commissioners of purchasing the works in the public interest, at 16½ years value of the profits of the last two years, provided that the power be exercised within two years from the passing of the Act; the cost of the bill to be added to the price.

MONDAY, MAY 4.

NOTTINGHAM (CORPORATION) GAS AND WATER, AND NOTTINGHAM WATER COMPANY'S BILLS.

Mr. VENABLES, Q.C., Mr. BIDDER, Q.C., and Mr. STEPHENS appeared for the promoters, the Corporation of Nottingham; Mr. DENISON, Q.C., and Mr. MICHAEL for the Nottingham Water Company, petitioners against the bill.

Mr. VENABLES, in opening the case for the promoters, said this was a bill to enable the mayor, aldermen, and burgesses of the borough of Nottingham to purchase the undertaking of the Nottingham Gas and Coke Company, and the Nottingham Water-Works Company, and for other purposes. In the first place, he was happy to say that one-half of the bill was unopposed, as the promoters had come to terms with the gas company, who were willing that the corporation should become possessors of the works. The only remaining question was as to the purchase of the water company's works. The Nottingham Corporation now asked for power to acquire the property of the water company under circumstances which he would detail. This was not one of those cases in which there was any ground for complaint of a bad supply of water, as the sources from which the supply was drawn were quite sufficient; and there was no ground of complaint respecting the general administration. The reasons why the corporation asked to acquire the property of the water-works company were of a general character, and not arising from any inadequacy or alleged inadequacy of the water company, nor would the corporation have promoted this bill had it not been that the water company had promoted a bill on their own part to acquire additional powers, to which the corporation strongly objected. The present company was the result of an amalgamation of two companies in the year 1845, and, at that time, their capital was £75,000 in £25 shares, the dividend being limited to 10 per cent. The ratepayers had, therefore, an interest in the water company, inasmuch as they were entitled to a reduction of rates when the profits became more than sufficient to pay the dividend. In 1854 the company came to Parliament to ask for an additional capital of £100,000, which they asked to raise at 10 per cent. The corporation objected to this, and deposited a petition against the bill. The company agreed to limit their dividend on the capital to 5 per cent., and, as an additional security, all the new shares were to be sold by auction, and the consequence was the shareholders had no allotment of the new capital. The bill, as deposited, contained the 10 per cent. clause, but, as passed, it contained a 5 per cent. clause. The £75,000 upon which they were entitled to receive a maximum of 10 per cent. was changed into a nominal capital of £150,000, on which they were entitled to 5 per cent., making no difference to the shareholders. They received a nominal £50 share in place of their £25 share, but were only entitled to the same dividends. The object of that was that the new capital was to bear a dividend of 5 per cent., as the larger capital sum was more easily saleable than the smaller one, and that it was better the whole capital should be in one uniform stock. The capital of the company now was £250,000, with a maximum dividend of 5 per cent., and the shareholders were entitled to certain reserved funds. In 1869 the company again came to Parliament with a large scheme, asking to raise £150,000 additional capital, with a maximum dividend of 7 per cent., and the omission of the auction clause. The bill was opposed chiefly on the new Dove Beck supply, and the bill was defeated. In 1873 the company again came to Parliament, asking for a largely increased area of supply, and an additional capital of £250,000; but no new source of water supply. The corporation opposed the bill, on the grounds that the capital asked for was too large, and 7 per cent. too much. The corporation satisfied the committee of the House of Commons that it was not reasonable that the new capital should be raised at 7 per cent., and that the auction clause should be omitted. The committee threw out the bill. In the present year the company came to Parliament to ask for an additional capital of £100,000, and a less extensive area, and for the omission of the auction clause. Now, the corporation said the additional district contained only 10,000 people, and at present they supplied 135,000, and that they did not require so much capital. What he contended on the part of the corporation was that that body was entitled to reap any future profits from the operations. The corporation now came forward to prevent the company reaping profit on future investments at the cost of the ratepayers, and to put an end to the litigation, the corporation asked to become proprietors of the works upon terms extremely liberal to the company. It was proved last year that a 5 per cent. share of the water company sold on the local exchange at £60—that was, £60 for a £50 share. It had actually sold for £70. If a 5 per cent. share bore 20 per cent. premium, a 7 per cent. share would pay £80 or probably £84. and what the company asked was that the substantial difference between £60 and £80 should be given to them out of the pockets of the ratepayers of Nottingham—in fact, the company asked for a bonus of £68,000, to which the company was in no way entitled. The main cause for asking for this bill was to put an end to litigation on the subject. Last year the corporation offered to secure to each 5 per cent. or £5 shareholder an annuity of £6. In the present bill it was proposed to refer the matter to arbitration, but still he would renew the offer of last year, and he should now call witnesses to prove the case of the corporation.

Alderman *Barker* was first called. He gave a history of the various bills brought before Parliament by the water company, referred to in the counsel's opening address. So far back as 1869 the corporation made overtures to the company for the purchase of the works. The offers of the corporation had always been rejected. The corporation were still willing to give the 6 per cent. to the 5 per cent. shareholders. The shares were selling at £68 or £70, but that might be due to the prospect of the 6 per cent. arrangement being made. The shares would ordinarily sell at £62. The corporation could easily raise money at 4 per cent. The corporation thought it desirable that the litigation they had had over these matters, at the cost of the town, should cease. The transfer of the water-works would be advantageous to the town, and the shareholders who have only a pecuniary interest in the concern would not suffer in a money point of view.

Cross-examined by Mr. DENISON: Some of the water taken from the Trent had been bad. The corporation opposed the Dove Beck Supply Bill because it was an expensive and unremunerative scheme. The corporation did not complain of the supply of water, nor of the water rates. It was not proposed to reduce the water-rates. There had been no discussion respecting it.

Mr. *Thackeray*, a manufacturer, gave his opinion that it was expedient the water supply should be in the hands of the corporation. It would tend to the benefit of the ratepayers. He thought, if the transfer was made, the corporation could reduce the water-rates. Besides that, a saving in the management expenses could be effected. All the works of the water company were most expensive.

Cross-examined by Mr. DENISON: If the works were transferred to the corporation, there would be a great reduction in the management expenses. There would be no coming up to London, and having dinners, which he believed the directors of the water company were wicked enough to have. He knew the fact that a person had been sent to a certain well of the water company to get water for the purpose of analysis, and the water was refused. The analysis had been obtained of water nearest the source of supply. He had not got the analysis with him. He did not himself complain of the water. If the corporation obtained the works, they would stop up one source—the Scotholme—of supply, where it was feared sewage got in.

In re-examination, *witness* said he did not know the cost of last year's litigation.

Mr. *D. W. Heath*, coroner for the county of Nottingham, said he was well acquainted with the wishes of the inhabitants of Nottingham, and there was a wide-spread feeling in favour of the water-works being transferred to the corporation. It would effect economy in management. Instead of keeping up three or four separate administrative bodies, the whole management would be under one body. The streets were being continually torn up, to the great disadvantage of the townspeople. The corporation have a right to have the profits on future investments. Our expenditure last year on the water opposition amounted to £1500, and this year it would not probably be less.

Cross-examined by Mr. DENISON: Complaints had been made as to the low pressure of water at fires. No doubt water used at fires was not charged for. He could not mention the name of any street in Nottingham which had been unnecessarily broken up, but he knew, as a member of the corporation, that several complaints had been made on this head. The complaints as to the short supply or low pressure at fires he had heard from men working at fires, and he had been at fires where the pressure was evidently low. The corporation were to give the gas company 6¾ per cent., and at the end of seven years 6 per cent.

Mr. VENABLES said he had the mayor of Nottingham present, who would prove the assent of the corporation to the bill, but he need not trouble their lordships with any further evidence, and, therefore, that was the case.

Mr. DENISON said he would call witnesses before addressing the committee.

Mr. *Leverton*, of Arnold, deposed that he was the chairman of the Arnold Local Board. They were very badly off for water in Arnold, and they should be glad to have a supply from the water company at Nottingham. Only a road divided Arnold from the mains of the water-works. They could not in Arnold erect water-works for themselves. I should not like to get a supply of water from the Corporation of Nottingham; I should sooner have the water from the company.

Mr. VENABLES: Why not have the water from the corporation, if they give it to you at the same price as the company?

Witness: I think we are in duty bound to support the company.

Mr. *Spencer*, of Basford, and the Rev. Mr. *Truman*, vicar of Arnold, gave evidence as to the dearth of water in Arnold.

The CHAIRMAN remarked that the whole question now at issue was whether the company were to be absorbed by the corporation. The parties might be able to settle the case by the morning. It was a matter of principle whether the

corporation were to absorb this company, which appeared to be doing its duty very well.

Mr. *T. Hawksley*, engineer to the Nottingham Water-Works, was next examined. He said it was now necessary to raise the increased capital, as they were £20,000 to £30,000 in debt. The works had a supply equal to 50 million gallons a day, and they delivered 21 millions. The water was always at high pressure.

TUESDAY, MAY 5.

Mr. *Hawksley* was recalled, and examined as to the proceedings of the water company in former years. He said what the company did was this—they proposed by a former bill that all shares should be sold by auction, and then it was no matter what was the rate of interest, because this arrangement brought them all down to a level of 5 per cent. After that the corporation proposed that there should be a fixed dividend of 5 per cent. The company declined that mode of dealing with the subject, and said that by selling the shares by public auction they could raise money at a lower rate of interest—which turned out to be the fact—than if they had a fixed dividend of 5 per cent. Then the corporation proposed to the company that they would give them a clause in regard to the supply of 100,000 gallons a day, and to this the company had no objection. Then the company, at his suggestion, in order to bring all the shares to the same level, devised a plan of doubling the amount of old shares, halving the dividend, and selling all the shares by auction. They persisted in it, the opposition of the corporation was withdrawn, and they never came to Parliament at all.

The CHAIRMAN: Did not the company bring in a bill to raise £50,000 at 7 per cent.?

Witness: That was at a much later period—in 1869.

The CHAIRMAN: Did they not go in for 7 per cent., and cut it down to 5?

Witness: No, my lord; not at all.

Mr. MICHAEL: You are confounding the gas with the water company, my lord.

Witness said there was £75,000 added to the capital of the company without being paid up. That brought the dividend to about 7½ per cent. The old money pays 7 per cent., but the last put in pays an uncertain dividend, because all the shares are sold by auction; and by the bill the dividend is £2 10s. per share, not at any rate per cent. at all. The truth is, the shares have been sold for a long time past at £62 10s.

Mr. MICHAEL: In order to make the concern more valuable as an investment?

Witness: Quite so. We have put in large sums of money voluntarily, arising from sales of property. We have bills for something like 100 years; and, inasmuch as the undertaking is a great success in every way, the shareholders have thought that perhaps Parliament would consider them entitled to some consideration. There is £25,000 arising from the sale of property not connected with water specially, and that has all gone into the undertaking.

Mr. MICHAEL: Although the shareholders derive no benefit from that, the purchaser would, by reason of his money being invested in it?

Witness: Yes; the undertaking has been nursed for more than 40 years.

Mr. MICHAEL: And now the corporation wants to buy the grown-up man at the price of the baby?

Witness: They want to look at it as a matter of dividend, whereas we look at it as to what our property is worth.

Mr. MICHAEL: And you object to have your property taken for less than its real value?

Witness: Certainly. The auction clause was put in entirely voluntarily. The system was originated because large expenses were cast upon the company by accidental circumstances, and the company were not prepared to meet those expenses, and accordingly said, "We will raise money in the cheapest way we can, so that the value of old shares shall not be depreciated, and the new shares bear the lowest rate of dividend possible. If we put in 3 per cent., the corporation would ask us to continue it."

Mr. MICHAEL: Having obtained your object by this sale by auction for a number of years, is there any reason why the corporation should insist upon the sale by auction continuing as to future capital?

Witness: That is a question for their lordships; but, in the case of the Sunderland Water Company, Parliament released them from the obligation, and said the object was served, and it was right they should have a minimum dividend. In the case of the Liverpool Gas Company, the obligation to sell shares by auction was removed; but it was removed when the public had got a great benefit, as they have in our case to the extent of £175,000. In that case, although the company was opposed by the Liverpool Corporation—a very powerful body—the obligation was removed by Parliament.

Mr. MICHAEL: Is there any reason why, if this undertaking passes into the hands of the corporation, any advantage would accrue which you cannot give as a water company?

Witness: None. There is no physical advantage—no advantage as to the natural supply of water or the means by which the water is supplied. In fact—and I speak from a wide knowledge, having been largely employed by corporations—the latter do not supply nearly so well as companies do.

Mr. MICHAEL: Do you see any benefit which would accrue to the district by the transfer of your undertaking to the corporation?

Witness: I do not see any; it is a fashion, but a fashion rather detrimental to the community than beneficial. We hear a great deal about sanitary advantages being attached to it, but there are none. We supply at a less price than the corporation could. The corporation could have as much water as they liked. We will give them 20 million gallons a week. We were the originators of the sanitary clause put into the Public Health Act of 1848, but there was nobody in Nottingham to be forced to take water for every one took it. The corporation, if they got their bill, would have to come to Parliament for power to supply the outlying districts and villages with water. Whatever powers the corporation have we have, and whatever powers the corporation have not we have not.

Cross-examined by Mr. VENABLES: We should require about three miles of mains to supply the outlying districts. We should want about £7000 for that, but that is not what the new capital is wanted for. In the districts where the population is increasing, a water company would want an increase of 4 per cent. on its capital. We take in by our bill about 10,000 additional population. Last year we proposed to take in 20,000 additional population, and then we asked for additional capital to the amount of £250,000, but it went very much beyond the limits you are now speaking of, as we proposed to go into the great colliery districts. I should have calculated for a larger expenditure, for the larger area, of more than £20,000. We want £30,000 at once to liquidate the debts due. For the new district we want £7000, and that has to be laid out at once. Some of our shareholders get 10 per cent. and some less than 5 per cent.

Mr. VENABLES: And you propose that those who have invested their money should get 4 per cent.

Witness: They have invested their money with the expectation, well known and always calculated upon, that at any future time they should obtain, in the usual way, a distribution of new capital which would assist them, of course, to a better dividend. I cannot tell the price in the market of shares since last year.

Mr. VENABLES: One witness said the shares were selling at £70, in anticipation of the corporation acquiring the works.

Witness: I never heard of it, but just at the moment when bills are brought before Parliament, there is always a great deal of speculation going on. I do not think the shares have ever been sold under £60 for many years, our credit is so high. We never knew why our bill was rejected last year.

This concluded the evidence on behalf of the Nottingham Water Company.

Mr. DENISON then addressed their lordships for the water company, and said the present was a case which his friend Mr. Venables opened by saying that there was absolutely nothing to complain of against the water company. The quality of water was good, the quantity was ample, and the Nottingham Water Company was the first to inaugurate the constant supply service. There was one thing he could not help alluding to. A witness said the board would not give any water for the purpose of being analyzed; but to talk of that when there were taps all over the town was simply ridiculous. Here was a water company which was really an exemplary company, because it had set an example to many other companies with respect to the quantity and quality of the water they supplied, and yet this company was brought before their lordships to be made a special victim of, to be handed over to the corporation, not because it did so ill, but because it did so well. Here was a company, one of the best in England, about which a special case was to be made. What was the object of the bill? Two things, for although the alderman who was in the box denied it, the corporation undoubtedly liked the importance of having the control and government of the water and gas concerns, which would place a considerable amount of patronage in their hands. That was not unnatural, it was natural, and it was a fact; and if at the present moment there was no water company in Nottingham there could not be the slightest doubt that their lordships would place the control of the water supply in the hands of the corporation. But that was not the case here. The corporation admitted that in the long run they would gain in a pecuniary way. Yes, but at the expense of the company. He contended that companies which supplied larger towns had, from time to time, to increase their capital. No doubt if the corporation could get these works at 6 per cent. interest, the company having a right to carry on the works at 7 per cent. would be an advantage, but the corporation were prepared to give 6 per cent. for a concern which they say ought to be limited to 5 per cent. Why did they do that? It must be clearly on account of the first motive he had imputed to them—that of self-glorification. The corporation had better allow the company to go on at 5 per cent. rather than buy the work at 6 per cent., thus giving 1 per cent. on a sum of £250,000. The counsel reminded their lordships that in 1851 the Government of the day brought in a bill to compel the water companies of the metropolis to sell their concerns to the Metropolitan Board of Works, but it was thrown out. In 1852, 1866, 1867, and 1868, similar attempts were made and failed, and again, in 1870, the Government failed to pass an Act containing a compulsory purchase clause as to the water companies. His learned friend could not point to any case in which a company had come to Parliament for additional capital at less than 7 per cent. His learned friend said that in 1854 they went below 7 per cent., but an agreement was an agreement. Parliament had laid it down that as long as a company behaved itself properly, it was entitled to the future development of a town. It was a socialistic doctrine closely allied to that of Mr. John Stuart Mill, to say that such a company should be deprived of the future development of a town. That doctrine was that the property of the noblemen he was now addressing should be valued, and that he (Mr. Denison) should be entitled, along with the British workmen who governed everything, to the property of their lordships. That doctrine did not differ from that which underlaid the principle of the bill of the Corporation of Nottingham. If people had taken shares on the understanding that the company would have the development of the town so long as it behaved well, and if on the 5 per cent. there was a premium, was it not a piece of Communism to take away the advantages Parliament had afforded the company? The company were not asking an unusually large amount of capital. Mr. Hawksley said they would require £20,000 for additional works; and was it unreasonable, in a growing place like Nottingham, that a company which had been carrying on its work for 20 years should come to Parliament and ask for the comparatively slight increase of £200,000 or £250,000? He ventured to say that the bill of the corporation ought to be rejected; and further, he said, the company could not, without increasing its works, do what the people of Nottingham and the outlying districts wanted. It was admitted that the limits of the water supply must be extended, and this could not be done without money. Then came the question whether the company was to be made an exception as to the amount of its dividend, and whether the clause as to selling shares by auction should be made compulsory. Upon every ground the learned counsel called upon their lordships to reject the corporation bill, and confer upon the company the powers they asked for.

Mr. VENABLES, Q.C., replied on the whole case for the Corporation of Nottingham, and reminded their lordships that what he had said on the previous day was that Parliament did not give compulsory powers of purchase of gas and water companies except as in the present case, when a company had a bill of its own, asking for further powers. The bill the corporation was opposing was the most important in their view, because they would not be doing their duty if they did not come to Parliament and say they objected to the company raising new capital on the terms they propose. But the corporation said: "If you suffer by the position we take up, we will introduce a bill to authorize us to acquire the concern compulsorily, and although an arbitration clause has been put in the bill, we are still willing to give you 6 per cent." Now what he urged was that so long as the company had its eyes upon profits arising from future investments, so long they would be coming to Parliament for additional capital. The company had no interest in the economical administration of its affairs. Everything they did would give them an excuse for raising more capital and give a premium on every £25 they raised. Instead of pursuing economy for the benefit of the town of Nottingham, the company had an interest in doing everything expensively, because it gave them an excuse for raising capital at 7 per cent., and so issuing the capital as to ensure a premium. He would not speak of the "unearned increment" of labour. The company had a fixed sum, and any earned or unearned increment belonged to the corporation. If their lordships rejected this bill, the shareholders would see that it was their interest to receive 6 per cent., which would make their shares worth in the Nottingham market £75 instead of £62, the figure at which they now sold them. The corporation would have an undivided interest in the economical management of the water-works. It was on these grounds the corporation asked their lordships to sanction their bill and reject that of the company.

The room was cleared, and their lordships consulted for five minutes. On the readmission of strangers,

The CHAIRMAN said: The committee have decided to pass the corporation bill as far as the gas company were concerned, but not so far as the water company were concerned. They had also decided to pass the water company's bill, limiting their new capital to five per cent.

Mr. STEPHENS said as regarded the gas portion of the bill, he was afraid some clauses would have to be arranged.

The CHAIRMAN: Very well, but I very much hope all parties will come to terms.

HOUSE OF COMMONS.

MONDAY, APRIL 27.

(*Before Mr.* MONK, *Chairman; the* MARQUIS OF HAMILTON, *Mr.* ONSLOW, *Mr.* HENRY O. LEWIS, *and Mr.* A. BONHAM-CARTER, *Referees.*)

TUNBRIDGE WELLS GAS BILL.

(*Concluded from p.* 624.)

Mr. Serjeant SARGOOD, in opening the case for the petitioners, could not help feeling that a more meagre case had never been brought before a committee. All that they really had in support of the case was Mr. Read, the secretary, and Mr. Spice, the consulting engineer, who had only recently been

appointed. He thought they would have seen some of the directors, somebody connected with the management, so as to give the committee an opportunity of knowing the internal opinions of the company. But not a soul who was responsible for the bill had been put forward; and although he did not wish, in the slightest degree, to make any imputation, he had thought that Mr. Delves, the agent of the vendor of the proposed new site, at least after the suggestion thrown out, would have told them something. He could only say that the bill was utterly unsupported, except by the secretary and consulting engineer. After drawing and depositing their bill and plans, they had evidently cast about to get engineers and surveyors to bolster up their case. The question now arose whether the time had not come when these gas-works should be placed in the hands of the local authorities, who had already the sewage and water under their management. This, in fact, was the main point for consideration. This was not a question of engineering, because both sites were pretty equal in that respect, but he submitted no reason had been assigned why the bill should not be delayed for another twelve months to enable the local board to bring in a bill next session. Could any danger be apprehended from a delay of that sort? The secretary had stated they might keep on for another seven or eight years, and the engineer, on whose evidence he ought rather to rely, had stated that there was no necessity for their removal, at any rate for another five years. What was it they proposed to do, therefore? To move before there was any necessity. They had been able for 32 years to supply the town advantageously by exhausting a moity only of their capital, and they asked for the privilege of quadrupling the present amount of capital. If it were necessary for them to remove at all, why should they raise such an enormous capital as that which they proposed? There had certainly been laid before the committee no evidence to justify such an amount being asked for. If they had convinced the committee that the time had come when a removal was necessary, then there remained the question, had they chosen a good site? He could not introduce the site of the local board as a competitive scheme; but he was entitled to say that the local board had a strong view that the northern site was the right place for gas-works, and not the south; and that they, as a sanitary authority, would be prepared, if necessary, to give a great deal of evidence of the inconvenience to which the inhabitants would be subjected if the committee were to allow gas-works to be built on the south side of the town. As to the north being the better site, they had shown their *bona fides* by being themselves fixed upon the site, on which they intended to erect gas-works if they had an opportunity of acquiring them. In the teeth of these considerations, he would ask what evidence was there to induce the committee to withhold the works from the local board in their efforts to obtain possession of them? It seemed to him there was literally none. To justify the application for increased capital, there was the most meagre evidence he had ever heard. Then, as to the necessity of immediate removal, their own primary witnesses had put them out of court. He was very much struck and impressed to find that when an experienced officer of the company, with that truthfulness which arose in the minds of honest men acquainted with facts, gave admissions which were against them, how very readily they found witnesses—equally honest, no doubt, but who were not sufficiently acquainted with facts—who gave a direct denial. So they had heard from one professional gentleman that they could not give gas for another winter. He would not, however, labour that point of the case, although they had been told by the secretary that they could go on for another winter. Unfortunately, that was the species of evidence alone with which they supported their bill. Not an independent or unbiassed opinion had been given. The views of the local board were simply these. They were honest in their purpose and desire to acquire the management of the gas. Having the water and sewage under their management, it became eminently their duty to make an attempt—with which Parliament had for a long time expressed its full sympathy—to get the gas also. They were *bonâ fide* in that, because they had found a site, and immediately they heard of the proposed bill, they called a meeting of the board and opened up correspondence with the company for the purpose of negotiating, but the company rode off on a technical difficulty that they were not in a position to treat. That was perfectly true, but the first step was to begin to treat, to see whether they were likely to come to some arrangement, and then to acquire by arrangement or parliamentary status such an arrangement. He was quite prepared to pledge his clients that in the event of their not being able to arrange without the necessity of a bill that they would lodge a bill next year for the purposes of acquiring the works. He did not impute any contumacy of feeling, but at the same time a certain amount of pressure was sometimes put upon companies if they would not come to a reasonable arrangement, by giving parliamentary powers to those who applied to enable them to purchase. He then briefly pointed out the evidence he was about to call, and observing that he would rather avoid commenting upon the purchase of the land, and without saying anything needlessly adverse or unkind of the promoters of the bill, asked the committee not to pass it.

Mr. *Thomas Lewis*, examined by Mr. WEBSTER.

I am the clerk to the Tunbridge Wells Local Board, and have been so upwards of four years. The supply of water and the sewage arrangements are in the hands of the local board. Their water bill was obtained in 1865, and the sewage bill in 1868. For both these purposes they had to borrow money upon the credit of the rates to pledge the funds of the town. I brought the intimation of the company intending to come to Parliament for a bill in the present session, before the notice of the Police Committee immediately I saw it in the newspapers. That was about the end of October. [Witness deposed at length to the steps taken by the local board in the matter, and read the reports of the committee to whom the bill was referred, the correspondence which had taken place between the local board and the gas company; also the resolutions adoped at the public meetings held to consider the bill.] The water-works and the sewage works involve the breaking up of the streets. It would, in my judgment, be an important consideration that the corporation should have the entire control of the streets under their own hands.

Mr. STEPHENS (in cross-examination): Great stress has been laid on the *bonâ fides* of the opposition by the local board. Who is defraying the expense of this opposition?

Witness: I do not know that I am called upon to answer such a question.

The CHAIRMAN: Oh, yes.

Mr. STEPHENS: Pardon me, you are the secretary to the local board. Who is defraying the expenses of this opposition?

Witness: Mr. Heugh, I believe, of Holmwood. That is the same gentleman who was a petitioner against this bill, and whose *locus* was disallowed by the court of referees. He is not a member of the local board. The local board, acting in this case in opposition, accept the payment of their expenses by a private individual, on certain terms and conditions. I have no documents that will show us those terms and conditions. I will not be positive that Mr. Heugh is a ratepayer. I cannot speak unless I have the rate-book here. I believe he does not occupy any property within the local board district. There was an election the other day for members of the local board. I do not think I sent him a voting-paper. I am not aware that he has any property in the town. I cannot tell. I do not think, in the ordinary sense of the word, he is a landowner or occupier in Tunbridge Wells.

Mr. STEPHENS: Then is this the position of things, that this *bonâ fide* opposition is conducted by the local board at the expense of an outsider?

Witness: Well, it is, to a certain extent. It was the intention of the local board to take the same proceedings that they are now taking had he made the offer or not. That decision was, I think, arrived at on the 4th of February. I am not aware that the local board is in the habit of accepting assistance from outsiders. This arrangement was entered into on the 5th of March. There was a communication made by Mr. Heugh's attorney to the committee to that effect. I have not the letter here. The minute is that, in the event of the local board presenting a bill to Parliament for gas-works of their own, he will, at his own cost, promote such bill. There are no further minutes as to that; it is merely done by correspondence, and I have not that correspondence. If you want it, I can telegraph for it, and have it here to-morrow morning.

Serjeant SARGOOD: But I will admit the opposition cannot be carried on by the local board out of the public funds.

Witness: The date when the first communication was had with Mr. Heugh upon the subject of the payment of expenses was some time previous to the 5th of March. I cannot tell you the day now. The committee was appointed on the 7th of January. I have read the resolution appointing the committee once. I may tell you it was in consequence of this that I brought the bill before the Police Committee, and they reported to the board upon the subject, and this is the result that they report:—It was moved by Mr. Commissioner Adie, and seconded by Mr. Commissioner Wells, and resolved—"That the report of the Police Committee, as altered, be now adopted. That a special committee be appointed to consider the bill about to be brought in by the gas company to repeal or amend section 60 of new Act of 1864, &c., and for other purposes; and that the committee do consist of the chairman of the various committees." That was a resolution appointing a committee to consider the whole bill. That committee made their report somewhere about the 31st of January, and that report was considered on the 4th of February. They could not report on it before unless they called a special meeting. I do not think there is any passage in the report of that committee objecting to this proposed site of the gas-works by the company; it is in the letter on the following day. I was instructed to enclose a copy of the report to the gas company, and I was then instructed what to say in the letter accompanying it.

Mr. STEPHENS: Now attend to my question. Was this question of site, which the local board said nothing about, the point of Mr. Heugh's opposition, and of his paying the expenses of this opposition?

Witness: I cannot say what his point was. That was the point he complained of for one. That was not in the report of the committee of the local board. In my letter of the 5th of February I said, "I am instructed by a committee of my board, appointed to consider your gas bill, to enclose a copy of the report which was adopted by the local board yesterday, together with a copy of the resolution passed unanimously at the same time, and I am further directed to state that the board strongly object to the construction of the gas-works in the vicinity of the High Rocks." I believe that the first mention of opposition to the site of the company was contained in that passage of my letter of the 5th of February. I do not recollect any other. The meeting of the board had been held on the previous day. There was nothing about the site in the report. It was in consequence of a resolution passed at the Ratepayers Association, requesting the chairman of the local board to call a public meeting that the meeting was called, and not by resolution of the local board. The notice of meeting was signed by the chairman of the board. There is nothing whatever in the notice respecting site; it was a public meeting to consider the bill generally. It was the only public meeting I know anything about. There was one other resolution submitted to the meeting which was withdrawn. It was—"That the proposal for the erection of new gas-works in the neighbourhood of the High Rocks is open to very serious objections, and would be very detrimental to the best interests of the town, and that this meeting has heard with great satisfaction that the town already possesses land which seems admirably adapted as a site for gas-works." That was proposed by Mr. Sharp, and seconded by Mr. Browell, and, after a long discussion, withdrawn. Mr. Sharp and Mr. Browell are two members of the local board. That resolution was not put to the meeting.

By the COMMITTEE: The date of that resolution was the 18th of February.

Mr. STEPHENS: Now as to that first report. I understand from you, or rather from the report which you have produced as to the main object of the bill, there is no controversy between you and my clients?

Witness: No; I believe not. The controversy is with respect to certain clauses in the bill.

Mr. STEPHENS: As to what you call the main object of the bill, this is an unopposed bill?

Witness: No; you can hardly take it as that. It is an opposed bill most decidedly. There is this passage in my own report:—"The main object of the gas company in introducing this bill seems to be the removal of the gas-works from their present position in the heart of the town to a district outside, and in the desirableness of such removal the committee most fully concur." Most decidedly, we wish to see the works removed from their present site.

Mr. STEPHENS: Now, let me ask you this. Do I find again this passage in the reports:—"The committee are not aware of any other provisions in this bill to which objection need be taken on behalf of the town; and, being favourable to its main purpose, they are not unwilling that it should pass into law?"

Witness: Just so, if the company would have complied with the wishes of the board; not without. There are several clauses of the bill which the board do not wish to see pass into law. I could tell you, if you let me have the bill, those parts which they do not wish to let pass into law.

Mr. STEPHENS: Do you seriously say that the local board have it in contemplation to buy the works of this company or establish a competing set of works?

Witness: They have it in contemplation to purchase the works if they can purchase them upon reasonably favourable terms.

Mr. STEPHENS: Supposing they cannot purchase them upon what they think favourable terms?

Witness: Then they oppose certain clauses of this bill. They certainly do not intend to ask for power to establish competing works.

Mr. STEPHENS: Then, am I to understand that this is the position: you oppose this bill; you try to make arrangements with the company; if you fail, the works are to remain where they are, and nothing is to be done?

Witness: Certainly not; nothing of the kind. They oppose this bill for the purpose of introducing a bill themselves next session for the purchase of the works. They also oppose it upon the ground that they consider the High Rocks site is a very objectionable one. I presume that the present company will supply Tunbridge Wells as hitherto. The board wish that the present works should be removed, and that they should be removed somewhere outside the district in a less objectionable part than the High Rocks. I mean outside the local Act district. The northern site is outside the local Act district.

Mr. STEPHENS: You say that the local board wish to do this, and that you oppose this bill now. You are to bring in a bill next year with Mr. Heugh's money for the purchase of the gas-works?

Witness: I said nothing of the kind. The resolution of the 5th of March was merely that if they were unsuccessful he would pay the expenses of opposing this bill, but he says nothing about introducing another bill. The entry on my minutes is, "That in the event of the local board presenting a bill to Parliament for gas-works of their own, he will at his own cost promote such bill; but of course on the understanding that if the bill passes he is to be recouped." But I think that is wrong. The real understanding between Mr. Heugh and the committee was that, supposing this bill was opposed, he would bear the expenses of this opposition; but if they should introduce a bill in the next session of Parliament, that the costs should be paid by the town themselves.

Mr. STEPHENS: But how can the town repay Mr. Heugh the expenses of their opposition this year?

Witness: They cannot.

Mr. STEPHENS: Then, of course, the plain meaning of the words is what you have read. Let me just ask you is this the position. You come forward here now as the secretary of the local board, at Mr. Heugh's expense, to throw out a bill in this session which, if thrown out in this session, is to be followed next year by a bill promoted at Mr. Heugh's expense?

Witness: No; I do not understand it so.

Mr. STEPHENS: Is it the fact that you are opposing this year at Mr. Heugh's expense a bill which, if thrown out, is to be followed by a bill next session promoted, in the first instance, at Mr. Heugh's expense?

Witness: No; certainly not.

Mr. STEPHENS: Why not?

Serjeant SARGOOD: He says you are wrong in the facts.

Witness: The opposition this year is being paid by Mr. Heugh. The expense of the bill next year will not be paid by Mr. Heugh.

Mr. STEPHENS: Again I ask you to refer to your own book, and tell me no if you can?

Witness: There must have been a mistake somewhere or other, because the understanding between Mr. Heugh was——

Mr. STEPHENS: Who keeps that book?

Witness: I do.

Mr. STEPHENS: Is that entry in your own handwriting?

Witness: It is, as it happens. I made that entry from a communication which was made to the committee through his solicitor. It was in writing. You can have it to-morrow morning. I confess I do not consider it as a serious matter. Supposing this bill fails, nothing can be done this year.

Mr. STEPHENS: What is your understanding of what is to be done next year?

Serjeant SARGOOD: I object to this gentleman's understanding. He is not the mouthpiece of the local board—he cannot know—they do not know themselves.

Mr. STEPHENS: Have you not had frequent complaints as to your sewage-tanks?

Witness: There have been complaints made to the committee from Mrs. Dean, who resides at the High Rocks (she is the landlady), with respect to the tanks. It was owing to the then contractor not conveying it away as soon as the solids were thrown out of the tanks on to the sides of the tanks. They were allowed to remain on the table for some time, and, of course, a smell arose, and I was then instructed to write to the contractor to request him to remove them at once.

The CHAIRMAN: How far are the tanks from the High Rocks?

Witness: I cannot say.

Mr. MICHAEL: Two hundred yards?

Witness: More, I should say.

Mr. STEPHENS: Two hundreds yards from one high road, and 100 from another?

Witness: There is only one high road, I believe; the other is a footpath.

Mr. STEPHENS: Has complaint been made to you of the nuisance from the sewage-tanks, and has the reply of the local board been that that was foreseen at the time the scheme was started?

Witness: I cannot recollect now; they are things that occurred, perhaps, some 12 months ago. I cannot undertake to say whether or not such a reply was given by the local board. It is very likely that, so recently as last November, the committee of the local board, through me, did remind the persons complaining of the nuisance from the sewage-tanks that the probable effect was known when the site was selected. I do not say that one word was then said about the contractor—the excuse set up to-day. The excuse set up about the contractor to-day is not a new point started before the committee, because I have written to the contractor on two or three occasions, stating to him that complaints had been made, and requesting him to be more careful in the future. There have been two or three complaints from the same person. There is only one person that has made the complaint, and she has made the complaint with respect to a cottage which a workman resides in close to the tank. This is a little old tumble-down cottage, belonging to the Earl of Abergavenny, which her workman resides in. That is the only one I am aware of. She does not complain with respect to her own house. I cannot say that that is the only house which can complain of this nuisance in the vicinity.

Re-examined by Serjeant SARGOOD: I believe Mr. Heugh is a gentleman of large property. He is not a ratepayer within our district. To the best of my belief he has no property in Tunbridge Wells; but I cannot tell you without the rate-book.

Serjeant SARGOOD: All I can find in your minutes seems very much to Mr. Heugh's credit as a public-spirited man. Let me read the whole of it. I see there was a letter from Mr. Cripps to Mr. Sharp stating that Mr. Heugh, of Holmwood, had authorized him to make the following offer in writing; and then I see within the marks of quotation "that in the event of the local board presenting a bill to Parliament for gas-works of their own, he will, at his own cost, promote such bill; but, of course, with the understanding that if the bill passes he is to be recouped." Now, that is one part of the sentence. You are not promoting a bill of your own?

Witness: No.

Serjeant SARGOOD: And therefore, at present, that does not take effect. Then it says, "And that he would also be prepared to lay before the board a complete scheme prepared by an eminent engineer for providing the town and district with gas, accompanied by an estimate of the cost." Then the paragraph goes on, that this was read, and the clerk was instructed to write in reply that the committee had the authority of the board to consult a gas engineer. It was so seemingly. Therefore so far as any scheme which he might go to the expense of propounding is concerned, you did not need that at the moment, and you have heard nothing more of it, I presume?

Witness: No. So far as a bill for works of our own goes, we are not promoting one. Neither of those minutes has anything to do with this present bill of the promoters. Mr. Heugh, I believe, did lodge a petition, and the local board lodged their petition. In our local board case we represent the public in general. Mr. Heugh had a particular grievance of his own.

Mr. STEPHENS objected to any reference to Mr. Heugh's petition, his *locus standi* having been disallowed.

Serjeant SARGOOD would not pursue the subject further.

Mr. STEPHENS requested all correspondence to be produced, and the witness said he would do so the following morning.

Serjeant SARGOOD: Now, with regard to sewage, you say that the only complaint has come from a cottager who is a tenant, as I understand, of Lord Abergavenny?

Witness: He lives under Mrs. Dean; the cottage is upon her farm. There is a special clause in the Sewage Bill for the protection of Lord Abergavenny. If he considers that his tenants have any reasonable ground of complaint, he can enforce it, and compel us to cover the tanks. The nuisance was not so much from the tanks as the carts passing backwards and forwards. The present contractor has to remove it in covered carts, so that even those little cottage grievances have been got rid of.

By the COMMITTEE: The first report made to the board was adopted unanimously. There are 24 members. I am not aware of any violent opposition being raised against the south site by the inhabitants, in a sanitary point of view, at any public meeting. I do not think one has been held, except that on the 18th of February. I can say that several persons have told me that it would be very injurious to the town. A great deal was said about its interfering with the sanitary welfare of the town. The present position of the gas-works is very objectionable, indeed, to those living round. I can speak from experience. The cause of objection is the very offensive smells that arise. I do not understand gas-works enough to speak about gasholders being nuisances or not. The general opinion of the town is adverse to the High Rocks site. It would interfere with all the best parts of the town—Hungershall Park, Nevill Park, and Mount Ephraim, the very best end of the town. I cannot say whether the residents in the neighbourhood of the site are favourable to it or not.

Mr. BONHAM-CARTER: What is the distance of the company's site from Mount Ephraim, and what is the distance of that proposed site from the inhabited part of Tunbridge Wells and this part that you speak of as being the best part—Hungershall Park and so on?

Witness: If you take it as the crow flies, it is about half a mile, I suppose, to Hungershall Park; but a surveyor will be called who can speak better to that than I can.

Mr. MICHAEL (through the committee): Do not all the places which you have said will be injured belong to Lord Abergavenny?

Witness: I cannot say, but I believe that several of the gentlemen who live there have taken long leases of 99 years—I believe the majority of them. I am only speaking from hearsay.

Mr. *William Charles Cripps*, examined by Serjeant SARGOOD.

I am the solicitor to the Tunbridge Wells Local Board. I produce a conveyance from a gentleman named Smith, of Colebrook Park, and his mortgagees, of the Northern Sewage Farm. There is a railway siding there. Our conveyance includes the right to use that [pointing out to the committee the plan attached]. On the site of the land acquired from the Dorking Charity Trustees it is proposed to erect the gas-works. That land did belong to the Dorking Charity. The local board have now acquired it by arrangement, by exchange with the previous owner. I produce the agreement. I have had the management of this business, and conducted the acquisition of the property. I have no doubt we have a right to use the railway siding in consequence of the deed. We should have, no doubt, to use the road over which the local board have authority and absolute control; but, with that exception, we could get to the railway without acquiring other land. I have not the correspondence here respecting Mr. Heugh. The local board have discussed amongst themselves who is to pay the piper. They have not passed any resolution on the subject; but I know there are not wanting public-spirited men amongst that board, and they do not consider it derogatory, even if another gentleman in the neighbourhood offers to assist them, to accept his assistance. Mr. Heugh strongly intimated to me that he was the owner of property in the local Act district. Mr. Heugh is, I believe, the owner of Huntley's Farm, Calmley Farm, and other properties in Tunbridge Wells, including the Walk's estate. I am acquainted with Mr. Heugh's personal grievance. The petition of the local board has nothing in the least to say to the independent grievance that Mr. Heugh petitioned about. There is no pretence for saying the local board are here to represent his grievance.

Cross-examined by Mr. MICHAEL: The following minute is correct:—"Mr W. C. Cripps attended and read a letter he had received from Mr. Heugh, of Holmwood, confirming his (Mr. Cripps's) letter to Mr. Commissioner Sharp, and authorizing him, on his (Mr. Heugh's) behalf, to enter into any act of indemnity to the local board on this matter, and that any steps the local board may authorize him to take in opposing the bill of the gas company now before Parliament he (Mr. Heugh) would indemnify him for," &c. This was read, and the following resolution agreed to:—"That as, by the 35 & 36 Vict., c. 91, the statute and powers which empowers the local board to expend money in an opposition to a bill of this kind, a lengthened process has to be gone through before this power can be obtained; and, as the time is now of great importance, the committee recommend the board to accept Mr. Heugh's offer to provide the funds for opposing the bill on behalf of the board." The conveyance grants the right of user of the siding and the roads. As regards Mr. Smith's land, it can only be used for agricultural and horticultural purposes, but the Dorking Charity land has no restriction whatever, and the local board have power to lay down gas and water pipes. The committee told me that they had arranged to have an independent engineer's opinion of their own, and I said that Mr. Heugh was prepared to call in an eminent engineer, and asked the committee to adopt him as theirs. I take it upon the understanding which Mr. Heugh has arranged with the local board, that he will provide the funds for the purpose of opposing this bill, and pay the engineers as well as the other expenses, or a portion of them. There is no distinct arrangement, but, of course, I assume that the engineers will be paid by Mr. Heugh. But I ought to state to the committee that some of the local board, in order that the difficulty as regards Mr. Leeman's Act might be met, siad they would provide for a certain portion of the funds; but I thought it my duty to mention the thing to Mr. Heugh. He was seriously ill in bed then, and said, "Whatever you think right to do I will confirm," and I wrote that letter which has been produced here.

Mr. *Lewis* recalled: All that the board did was to adopt the Gas Committee's report of April 1. Mr. Heugh's offer has never been before the board.

Mr. STEPHENS said he should call for the letters which had passed between Mr. Lewis and Mr. Cripps.

Mr. *Cripps's* evidence continued: Mr. Smith is a party to the agreement for an exchange of land to the Dorking Charity. I am quite certain that the local board, under this conveyance and the subsequent arrangement, have power to make such use of the property as is necessary to carry out their gas-works.

By the COMMITTEE: We have a general right to use the roads as a local board. We claim a general right to use all roads within the district.

By Mr. MICHAEL: The parts referred to by Serjeant Sargood are not in a direction exactly the reverse of the direction which leads to the proposed site.

Mr. *James Mansergh*, examined by Mr. WEBSTER.

I am an engineer, carrying on business at Westminster Chambers. I prepared the plan on the wall of the committee-room. It is a copy of the Ordnance plan.

The Hon. *Francis George Molyneux*, examined by Serjeant SARGOOD.

I am chairman to the Tunbridge Wells Local Board, and have been so for ten years. I called the public meeting referred to at the instance of the Ratepayers Association. I was chairman. The two resolutions read were passed; a third one was withdrawn. We have had the report of an eminent engineer with respect to the northern site. He advised us that that site was favourable for the purpose. I think it the most important thing that could be brought under our notice that the local board, having possession already of the sewage and water, should also get possession of the gas. I think that every corporation and every local board should have so important a matter as the supply of gas, even if it was merely considered as a police measure, under their own supervision, and under their own guidance. It is a very material thing as regards breaking up the streets, of course. Apart from having any site of our own in the north, as chairman of that public body I do not think I should have recommended the existing company to plant their new works in the south, supposing new works were necessary. I think it is admitted that wherever gas-works are erected there is a certain nuisance; and the High Rocks, as everybody knows, is a very picturesque spot, very much frequented both by residents and visitors of all descriptions, and I think they would certainly be a nuisance there. My chief reason is looking at it as so important that the town should have the gas-works in their own hands. It was under that state of feeling that I initiated the communication with the company as soon as I found they were coming to Parliament. Prior to the public notices, I had no idea that they were thinking of coming during this session for a change of locality, or had any notice of it in any way. There was no communication to me by them. The moment we had an

official communication on the subject we appointed a sub-committee to consider the question. I was present at the committee when they had a discussion on an offer of Mr. Heugh, and when they resolved to recommend it for the consideration of the board. I do not think the positive offer of Mr. Heugh was communicated to the local board—merely the circumstance that the expense of the examination of sites and such engineering works would be borne by other parties and not by the rates. The local board and Mr. Heugh both lodged petitions against this bill. I suppose Mr. Heugh did so on honest independent grounds; we certainly did. There is no pretence for saying that Mr. Heugh having lost his *locus standi*, the local board are being paid by him to carry out his personal opposition; it was quite resolved on long ago. I have heard very strong expressions against the works being built in the neighbourhood of the High Rocks, and also very strong expressions in favour of the local board having the management of the gas themselves.

Cross-examined by Mr. MICHAEL: One of my principal objections is that gas-works are a nuisance, and that the High Rocks being a locality which the inhabitants and visitors visit, there ought not to be gas-works erected there. I have always been of that opinion. I do not think I have ever expressed an opinion that the southern site was a very suitable one for gas-works to be erected on. I have always been of opinion, and have so expressed myself, that the southern site chosen by the company was a bad one. I should say the neighbourhood of a sewage-tank is not considered a very desirable thing in a locality which is visited for pic-nics. I should think it must be considered a nuisance by persons in general.

TUESDAY, APRIL 28.

Serjeant SARGOOD put in a voluminous correspondence, which had been asked for, relating to the opposition. They were letters which had passed between Mr. Heugh, Mr. Cripps, as his attorney, and the Gas Bills Committee of the Tunbridge Wells Local Board, with regard to Mr. Heugh's indemnity of costs.

The Hon. *F. G. Molyneux* recalled, and cross-examined by Mr. MICHAEL.

I have been chairman of the local board for a considerable number of years, and have taken very considerable interest in all matters affecting the town of Tunbridge Wells. I consider it an extremely well-managed town, both with respect to its sewerage arrangements, its water, and its lighting arrangements. I cannot say the rateable value of Tunbridge Wells at the present time; a little over £120,000.

Serjeant SARGOOD: Thus, houses, £120,185; land, £5264; total, £129,449.

Mr. MICHAEL: Land only pays one-fourth?

Witness: That is so. The standing debt of the corporation is £224,000. We have included works of sewerage and water supply. Beyond the Local Government Act our powers are confined to borrowing money on one year's assessable value, unless we get special exemption by Provisional Order. We have no Provisional Order for extending our borrowing powers.

Mr. MICHAEL: What is the annual burden entailed upon Tunbridge Wells by the exercise of your borrowing powers? You have to pay not only interest, but a portion of the principal. I suppose it extends over a period of 50 years?

Witness: Yes. We pay instalments of principal and interest, so as to make it uniform over the whole period. I cannot say what the annual amount is.

Mr. MICHAEL: What is the amount of interest you pay, calculated as to principal, so as to make per centage. Does it come to 6½ or 6¾ per cent.?

Witness: I suppose it does. That money has been, I presume, expended mainly in works of sewerage and water supply. I cannot tell how much of the burden is met by water-rents. A penny in the pound realizes £500 on our rateable property. There are two rates in the year of 1s. 6d. each. To make up a deficiency in the water accounts it would come from the general district rate. The general district rate does not include the water. If we had not sufficient to pay our instalments when they became due, we should make up the deficiency out of the general district rate. We acquired the land for sewage purposes by compulsory powers, and we are limited to use that land for agricultural or horticultural purposes.

Serjeant SARGOOD wished to explain that it was by agreement that the northern land had been obtained. They had acquired the southern land by compulsory powers.

Witness: Sewage works are not a nuisance if properly managed and conducted in the way we hope to see adopted. The southern site is intermediate as between the sewage-tanks and the farm. I think the northern site would be superior to the southern. Under all circumstances gas-works would be a necessary nuisance, but they would be a less grievance at the north than at the south.

Mr. MICHAEL: Do you agree with the removal of the gas-works from the present site? Have you been willing that the company should occupy the present site for gas-works?

Witness: I should very much prefer to see them removed and occupying the northern site.

Mr. MICHAEL: Giving up the southern site, you would offer no opposition to our going and erecting works on the north?

Witness: My own wish is to have the gas-works in our own hands.

Mr. MICHAEL: Then you attach greater importance to having the gas-works in your own possession than to the question of site. Are you aware that by the law, although you are given the management of all sanitary matters proper, gas-works are excluded—you are debarred—that is, that the local board have no control whatever over gas lighting; that it is a matter of which the local board can take no cognizance?

Witness: Unless we have a private bill.

Mr. MICHAEL: Are you aware that the Legislature expressly says you must not promote any bill in Parliament for competing works?

Witness: Yes.

Mr. MICHAEL: The Legislature has laid it down that you must get the views of your constituents, in such a position, at a public meeting; and that meeting must be called, in the first place, in accordance with the Act of Parliament. But do you not consider Tunbridge Wells extremely well lighted?

Witness: Yes.

Mr. MICHAEL: Then why do you wish the gas to be in the hands of the local board?

Witness: Because there are several advantages which the local board would derive. In the first place, there would not be a per centage to shareholders.

Mr. MICHAEL: But do you not contemplate paying a fair commercial value for the undertaking?

Witness: Yes.

Mr. MICHAEL: You will therefore be paying in one sum, instead of from year to year, in order that the shareholders may in perpetuity have the same amount of money in some other way?

Witness: I think the large profits that would accrue from it would pay more than that.

Mr. MICHAEL: Then do you contemplate having the undertaking for less than it is worth? Where are the dividends to be paid to the shareholders in perpetuity to come from? If you lower the price, you know you lower the profit. As chairman of the local board, you say you strongly urge this measure; surely you must have some knowledge of what is the benefit that can possibly accrue to the inhabitants?

Witness: I attach more importance to the purchase than to the site. The local board might wish to move gas-pipes and lamps to particular parts, to ensure a good light to certain streets. We cannot do that now.

Mr. MICHAEL: But you are the absolute masters over the lights; you can put them anywhere in your streets?

Witness: We cannot do so by our contract.

Mr. MICHAEL: In June that contract terminates?

Witness: Yes; I believe it does.

Mr. MICHAEL: Then you can get a fresh one?

Witness: We are limited now to putting lamps 75 yards apart.

Mr. MICHAEL: That is, under the general Act, you must not put them wider than 75 yards apart, but you can put 20 in the distance if you like?

Witness: Very often it happens we want to move lamps a much longer distance.

Mr. MICHAEL: But you cannot say that would be improving public lighting?

Witness: Then we could light the lamps on moonlight nights.

Mr. MICHAEL: Have they refused to supply you now?

Witness: No.

Mr. MICHAEL: Of course your expenses would be precisely in proportion to the quantity of gas used?

Witness: Still, I think we should be able to do it cheaper than the company.

Mr. MICHAEL: Your first reason is that the town should have the works in their own hands, the question of purchase being more important than the site. If the company manage the gas-works at the southern site, do you think the rates would have to be raised in Tunbridge Wells?

Witness: I do not know.

Mr. MICHAEL: Do you think that, if you managed the gas on the northern site, the rates would be lower?

Witness: Yes, I do.

The CHAIRMAN: You have now the management of water and sewage, and you think it would be of advantage that the local board should themselves carry on the gas-works—acting as a sort of middle man between the public and the company?

Witness: Yes. It would enable us more expeditiously to carry out the wishes of the public.

By Mr. LEWIS: From my knowledge of Tunbridge Wells, I should not say that the High Rocks were only frequented by the lower classes. All the persons I have spoken to are favourable to the town taking the gas-works. I do not think anything offensive could come from the sewage-tanks if properly emptied. On the whole, I think the gas would be supplied cheaper if in the hands of the local board. We could borrow the money to pay off the principal and interest, whatever the cost would be, at a less per centage than the amount payable in dividend to the shareholders, and in that way there would be a saving.

By Mr. BONHAM-CARTER: I cannot tell the exact date when we first proposed to oppose this bill.

Mr. William Faulkner Browell, examined by Mr. WEBSTER.

I am a justice of the peace for the county of Kent, a member of the local board of Tunbridge Wells, chairman of the Sewage Outfalls Committee, and also chairman of the special committee to consider this gas bill. Mr. Molyneux is chairman of the board, and *ex officio* member of all committees. The Gas Committee was appointed specially to consider the provisions of this bill of the company, of which we had notice in the ordinary way. We considered it our duty to try to negotiate with the company for the purpose of acquiring the works. We made them a distinct offer. They absolutely refused to negotiate. We offered to refer the question to two arbitrators. It was an offer in writing. We had a conference with the directors of the company. The board passed a resolution suggesting a certain mode of entering into negotiations. We met the directors of the company under powers conferred upon us by the board, and we proposed certain terms of negotiations.

Mr. MICHAEL: But first let us have the authority from the board.

Witness: We acted as a committee on behalf of the board. We had to consider about giving the company proper compensation. It was a question whether the compensation should be a sum down or a perpetual annuity; if a perpetual annuity, whether the annuity should not be according to the precedent at Glasgow, giving somewhat less than the 10 and 7 per cent.

Mr. STEPHENS: Are we discussing the terms of the proposition on which the local board shall buy? I object to any allusion being made to what may be done in Glasgow.

Witness: I was called upon to state why we could produce cheaper gas than the company, and I was giving you my reasons. The gas company were about to incur a great expense, intending, no doubt, to charge us the more for gas, to enable them to give their shareholders 7 per cent.

Mr. STEPHENS again objected.

Mr. WEBSTER: He is entitled to tell us his motives.

Witness: We shall not want to do anything more than make the thing pay its expenses. We shall not want to provide 7 per cent. for a proprietary body. Another reason is that the local board do not receive any remuneration, and would not for their superintendence of the gas-works, like the directors have. Another reason is this: If we get the matter into our own hands, we shall in all probability establish them on our own land, and no expense would have to be incurred in the purchase of land. Another reason is this: We should have the offices connected with the gas business in our own town-hall, and would save thereby the expense of a separate office. These are my main reasons for believing that the town would be able to produce gas at a cheaper rate than the gas company can. In selecting the site at the south, I think it will be an injury to one of the most picturesque places of resort; that is if they were to be in the south. I do not think that if they were in the north they would annoy any human being. I will not admit that the tanks at the south have been any nuisance to anybody except to the occupants of a particular cottage which is rather near. We have had a complaint from the occupants of that cottage, but beyond that I am not aware of any complaint from any quarter. I think that arose mainly, if not entirely, from the way in which the tanks were emptied by the late contractor. We have taken some pains to remedy that. We did put down a new hard road to the High Rocks, but that was principally on account of our sewage farm. The prevailing wind is south-west, and would blow any vapours down the valley to Tunbridge Wells.

Cross-examined by Mr. STEPHENS: You may call my views theoretical if you like. I have never been a director or manager of gas-works. I do not know that the gas company at present only pay £20 a year for their offices. We received copies of the bill in December, and did not take any steps until February.

Mr. STEPHENS again asked for the official sanction of the board to the Gas Bills Committee to commence the opposition to this bill. In the absence of express power, it might be that this committee did not represent the board.

Serjeant SARGOOD thought that if the local board were now disputing the acts of the committee he could understand his learned friend's argument.

The CHAIRMAN: What is your objection, Mr. Stephens?

Mr. STEPHENS: That no authority whatever has been shown for the sealing of this petition, and that this petition may be now on the table without having been seen by the local board—the recommendation emanates from the committee. I wish in the first place to submit that this is not the act of the local board, and not being the act of the local board is not the petition of the petitioners.

The CHAIRMAN (after some consultation): The committee are of opinion that this petition now before us is the petition of the local board, signed by the chairman.

Mr. STEPHENS: Who contributes to the expenses of this opposition besides Mr. Heugh?

Witness: I know there are several members of the local board who day after day have come up to town and stopped here for several days entirely at their own expense, and that I consider in the nature of a contribution. I do

not think it is quite £1000 a year that we lose on the water. The land on the north I put at about £180 per acre.

Mr. ONSLOW: Are you aware that any of the local board are shareholders?

Witness: Two of them are directors.

Mr. ONSLOW: Are all the shareholders of this company inhabitants of Tunbridge Wells?

Witness: I really cannot say.

Mr. MICHAEL: I am told they are.

Mr. STEPHENS: Is £1000 a year now the annual charge on the district rate from failure in the water-rents?

Witness: The water-rents are increasing every year, and I hope before long will reach to an amount sufficient to meet the annual outlay.

By Mr. LEWIS: We were not very fortunate in our engineer in the first instance, and to that cause I attribute the fact of the water-works not paying now.

Mr. *J. S. Wigg*, examined by Mr. WEBSTER.

I am a justice of the peace for the county of Kent, a member of the Tunbridge Wells Local Board, and chairman of the Paving and Drainage Committee. I have been a member since 1859. It would be for the benefit of the consumers and the local board, who are large consumers, if the gas-works were in our hands. We are now completely in the hands of the gas company for the amount we pay them, I think about £2000 a year. I do not know any worse place to go to than the High Rocks. This is a very picturesque spot. James I. had a cottage there in 1615. The gas-works would have nothing at all to injure in the north.

By Mr. MICHAEL: We can raise money at a much lower rate of interest than 7 per cent. The directors may raise money by shares in order to get their 7 per cent. dividend on all money spent.

Mr. *John Sharp*, examined by Serjeant SARGOOD.

I am a barrister, and a member of the Tunbridge Wells Local Board. I am chairman of the Burial Board Committee. I am decidedly opposed to the gas-works going on the southern site. I cannot conceive a more ruinous—I have used stronger language, and said a more madder thing, than to take gas-works into that beautiful valley of the High Rocks. Scarcely any person who visits Tunbridge Wells, health and weather permitting, would fail to go to the High Rocks; and I was very much astonished to hear from a witness that they were frequented by a certain class. They are frequented by all classes. I read the other day in the newspapers that the Empress of the French and her son travelled there *incog.* I should like to give the shareholders a fair price for their undertaking; for even if we paid them superabundantly, it would be cheaper for the town to have the gas-works in their own hands, than that they should remain in the hands of the company.

By Mr. MICHAEL: I do not remember saying that the gas company should not have the gas-works.

Mr. MICHAEL: But here it is reported in a newspaper published at Tunbridge Wells.

Witness: It may be so. I do not think it was more than a nod of dissent that we refused to discuss it.

Mr. MICHAEL: Have you done anything more in this matter?

Witness: Yes. I have looked out a site. It is on the northern farm. I got a provision inserted in the agreement that we could lay down gas and water pipes along it. I have always looked forward to the town possessing the gas-works.

WEDNESDAY, APRIL 29.

Mr. *Apsley Smith*, examined by Serjeant SARGOOD.

I am a member of the Tunbridge Wells Local Board. I object to the southern site for gas-works because of the large number of cottages which would gather round and become a very great nuisance, and then the going to and fro of obnoxious matters would also be a nuisance to the High Rocks, and the beautiful country surrounding them, which are now great attractions. The objections I mention are not at all applicable to the site at the northern valley. I do very strongly sympathize with the view of the local board, first, that the gas-works should not go to the High Rocks; secondly, that they should be placed in our hands, and carried on for the future by the local board. I know Mr. Delves perfectly as agent to the Earl of Abergavenny and a director of the gas company. He is a member of the local board. It is not probable he would sympathize with my views.

By Mr. STEPHENS: The obnoxious matters would go away from the town if the works were placed on the northern site; they would be in a place not likely to be affected by them. The High Rocks are just outside our district.

Mr. STEPHENS: Then you come forward to protect those places not in your own district?

Witness: They are not in the town district.

Mr. STEPHENS: On the same principle, then, you are come to protect any place within a carriage drive of Tunbridge Wells?

Witness: I suppose so.

Mr. STEPHENS: What obnoxious matters do you think will go to and fro from these gas-works?

Witness: I know what goes from the other works. I suppose the same will go from these. It has the very beautiful name of "blue billy."

Mr. STEPHENS: Do you know that these works will be on the site of the London and Brighton Railway, and that all this refuse will be sent away by rail?

Witness: I do not imagine that the products will be sent along the line for about a mile, and then put into carts again.

Mr. STEPHENS: Do you know what quantity of this would be used in Tunbridge Wells?

Witness: I do not know. I only know we have a very great smell from them now. The carting to and fro of coke along the road would be a nuisance.

Mr. STEPHENS: Do you seriously mean to say that the residuals which would be at these gas-works could be consumed in Tunbridge Wells?

Witness: I only know they go through the town of Tunbridge Wells with it now.

The CHAIRMAN: Assuming that what you say of the smell is correct, would a south-west wind bring it to Tunbridge Wells?

Witness: Over a considerable portion of the town—Mount Ephraim.

Mr. ONSLOW: Have you ever heard of any complaint, of any row, or anything going on at these High Rocks?

Witness: No.

Mr. *Daniel Baker*, examined by Serjeant SARGOOD.

I live at Pembury. I was engaged as one of the enumerators in taking the census of 1871 with Mr. George Baldwin. I was occupied on that part of the district inside the 4-mile radius from Tunbridge Wells, and outside the 3-mile. The number of persons in my district was 665—that was of persons within the 3 and 4 miles. Mr. Baldwin had 727, making 1392 altogether. I took it in 1861. There had been an increase of 135. In 1871 there were 132 inhabited houses. I cannot say how many there were in 1861.

By Mr. STEPHENS: I do not speak of the whole of Pembury. I did not take the distances from a map. An old inhabitant planned the districts out. Some parts of my district at the outside were 4½ miles.

Mr. STEPHENS: Is it within your knowledge that such a thing has been mooted and discussed that the Pembury people should have their own gas-works?

Witness: I do not know what they have discussed. I have heard something about it.

The CHAIRMAN: Have they no gas supply from private sources in Pembury?

Serjeant SARGOOD: No. (To witness:) Do you know whether that was not occasioned by the gas company refusing to supply those that were even within the 3-mile radius?

Witness: I do not know.

Mr. *George Baldwin*, examined by Serjeant SARGOOD.

I was employed with Mr. Baker in 1871 to take the census at Pembury. I had to take that part of the parish within the 3-mile radius of Tunbridge Wells. From the South-Eastern Railway Station to the new church is 3 miles. The number of inhabitants in my district was 727, and inhabited houses 128.

Mr. *Robert Haffenden*, examined by Serjeant SARGOOD.

I live at Groombridge, Speldhurst. I was employed in taking the census of 1871. The distance would be about 4 miles from Tunbridge Wells. The number of inhabitants was 589—291 males and 298 females; 122 was the number of inhabited houses. It is a scattered district. I took the census 10 years before. I have not got the returns. I have lived at Groombridge more than 20 years. There is an increase there, but not very great.

By Mr. STEPHENS: Houses are growing up pretty quickly. There has been a talk of having gas there.

Mr. *Henry L. Sopwith*, examined by Serjeant SARGOOD.

I am a member of the Royal College of Surgeons, practising at Tunbridge Wells. I have practised in Tunbridge Wells more than 40 years. I attend here under a Speaker's order. I am thoroughly conversant with Tunbridge Wells and its neighbourhood, and the ordinary requirements of the inhabitants. I have been for a long time connected with the Tunbridge Wells Gas Company. I was connected with it from the first commencement, 30 years ago, up to last October—I mean from its birth. I was a shareholder to a considerable extent. I am not now a director or in any way connected with the company. My shares were sold in October of last year. I did some business—some calculations—after I retired from the board. I think it was about Michaelmas. Mr. Barlow, who is now dead, was our engineer prior to Mr. Spice. It is so long, I do not recollect how long he was our engineer. Before I left the board the question of removal to the southern site was under discussion. The consideration was to supplement the present works—not an absolute removal, only a partial one. The subject was under discussion when I was a member. The question had once been asked of Mr. Barlow about removing the works. He shook his head and said, "If you do you must consent to the loss of £12,000 to begin with." He indicated to our minds that he did not advocate removal. That was the view I took, that it was not advisable to move. I have had no reason to alter that view at all. I retired from the board because I disliked the report of Mr. Spice. I thought it incorrect. I communicated my views at the board. That was one of the main reasons why I seceded from them. We got our supply of coals for the making of gas from Simon Magnus, of Strood. They were seaborne coals. They came through to Strood, then by South-Eastern Railway. We were not allowed to use household coals. I did not know that the Brighton Railway could bring in seaborne coals. I have heard Newhaven and Seaford mentioned as ports for seaborne coal, so as to be brought up by the Brighton line. We had some cannel to bring the gas up to the standard occasionally. Independent of the broad question of removal, the southern site was discussed at the board. I objected to the removal altogether as being perfectly unnecessary. I have not examined either the northern or southern site. A great deal will depend upon the care at the works as to a nuisance.

Serjeant SARGOOD: Assuming anything capable of escaping which may give offence, can you say anything as to the tendency of a prevailing wind blowing the vapours into the town from the northern or southern site?

Witness: I have not examined them.

Cross-examined by Mr. STEPHENS: I do not believe the company will get any dividends if they go to the High Rocks. I am still of opinion that it is undesirable to move.

Serjeant SARGOOD: Are you aware that in saying the works ought not to be removed from the present site you are contradicting all engineering evidence?

Witness: I say they have plenty of room for the next ten years. Mr. Barlow's opinion was given two or three years ago. I always look at the great loss there would be in the sale of coke. I have never considered the possibility of a coal supply on the Brighton line. I have known Mr. Heugh some few years. He sent for me one day last June, and asked if it was true we were contemplating removal. I did not go into a conversation with him.

Serjeant SARGOOD: I am going to call Mr. Heugh. After what has been said, I should not think of closing the case without calling him.

Mr. STEPHENS (to witness): Now, about these vapours. Supposing ordinary care were used, would they be offensive to the town of Tunbridge Wells?

Witness: I should say they would be too much diluted to reach Tunbridge Wells.

Mr. STEPHENS: Do you think there would be any nuisance by noxious materials being carted?

Witness: They are obliged to send the ammonia out now. They do not make sulphate of ammonia. It is pumped out into carts, and the railway people fetch it. Blue billy, taken out, lies there for some considerable time; and if large quantities of gas had been forced through it, there would be a large amount of sulphate of ammonia, which would be offensive if removed through the town.

Re-examined by Serjeant SARGOOD: I had conversations with Mr. Barlow a short time before he died. I do not think I ever asked him a question about removal afterwards. The company have got sufficient room for another 60-feet telescope gasholder, and they have a large plot of room to put up more retorts. The purifiers they have put down.

Serjeant SARGOOD: Supposing this application for removal might become a wise thing some day, would any detriment be occasioned by a delay of one or even two years?

Witness: I cannot say there would.

The CHAIRMAN: Is the manufacture of residual products a nuisance to the town at present?

Witness: They are all taken away. I have not heard any complaints recently. I have not considered the question whether the works at the proposed site would be a nuisance to Tunbridge Wells.

Mr. STEPHENS: Would you kindly ask him what sum he thinks would be required to spend on the existing site to enable the company to remain there?

The CHAIRMAN: It is undesirable to reopen that part of the evidence.

The Marquis of HAMILTON: Does the manufacture of sulphate of ammonia produce an unpleasant smell?

Witness: Yes.

The Marquis of HAMILTON: Is it necessary to have a certain amount of space for that manufacture?

Witness: Yes.

The Marquis of HAMILTON: Have you gone into the financial question why you think it would not be wise to remove at present?

Witness: The sum to be expended for the erection of the proposed works, the laying down of mains, gas-lamps, &c., would amount to £30,000. The company can get increased price up to 6s.

Mr. ONSLOW: As they increased the price of gas the rates would be higher?

Witness: The gas is paid for separately.

Mr. ONSLOW: You think that by going to the High Rocks it would enhance the gas-rate?

Witness: I think so; they would have to lay out a large amount. In order

to pay 7 per cent. the Tunbridge Wells rates would have to be enhanced, and the consumers would have to pay more.

Mr. ONSLOW: Are you the only member of the board of directors who differs?

Witness: I am the only member who has sold out.

Mrs. *Jane Dean*, examined by Serjeant SARGOOD.

I am the present lessee of the High Rocks, Tunbridge. I have been there from 1849. It is to supply visitors who come to the High Rocks. I have no tap-room. I supply refreshments, luncheons, and dinners for parties. It is a private hotel. I let apartments occasionally. The High Rocks are a great attraction, and it is a great advantage to me to have lots of people there. I am a large shareholder in the gas company. Notwithstanding that I should prefer them going somewhere else than near my house. Mr. Friddenham applied to me, and asked me if I would allow him to have a little party once a week, and I allowed him. It was the private quadrille party who used to meet at the Corn Exchange or the Sussex. They were not admitted without tickets. They were not admitted until after seven o'clock. Our chief business was over at that time. They were parties of respectability. I would not allow them to be there on any consideration if they were not. Persons of all rank come there. I supply them refreshments, and some bring their own. I get up large dinners sometimes. I have private rooms for dinners and luncheons.

Mr. *Henry J. Austin*, examined by Serjeant SARGOOD.

I am a surveyor and valuer, of Wadhurst. I know the place near the High Rocks, which the gas company have chosen for their site. I had instructions to go there, and put what I considered an agricultural value upon the land. It is all agricultural land now. I valued it at £40 per acre.

The CHAIRMAN: What do you consider would be the building value?

Witness: There is no limit to that.

Mr. *Dennis Rigden Charlton*, examined by Serjeant SARGOOD.

I am a land surveyor and valuer, residing at Tunbridge. I have had considerable experience in the value of property in that neighbourhood for the past 20 years. I know the southern site. In my judgment the fair price per acre is from £38 to £40. It is a point of great attraction, and, in my judgment, it is not an advisable site for gas-works.

The CHAIRMAN: You put it at its agricultural value?

Witness: Yes; building lands would depend upon the access of roads, and other things.

Mr. *E. Brentnall*, examined by Serjeant SARGOOD.

I am the town surveyor of Tunbridge Wells. In my opinion the fair value of that land would be about £40 or £50 per acre.

Mr. *John Heugh*, examined by Serjeant SARGOOD.

I have businesses in Manchester, and many large places, and reside at Holmwood, Tunbridge Wells.

Serjeant SARGOOD: Do not talk about your own private petition and personal grievance; you are not entitled to do so. Your land adjoins, I think, the land proposed to be taken by the gas company?

Witness: Yes; I know the contents of my own petition, and the grievance set out there.

Serjeant SARGOOD: You have offered to the local board to pay the expenses?

Witness: No; I did not make any such offer. [Letter handed to witness.]

Serjeant SARGOOD: Was that letter written at all with a view for the local board to represent your personal grievance, or only with a view to assist them in carrying out the public case?

Witness: Certainly not at all in connexion with my private grievance.

Mr. BONHAM-CARTER: Did you do it entirely on public grounds?

Witness: Entirely. I have never seen the petition of the local board either in print or in draft. I have never been consulted about it, or seen it at all.

Serjeant SARGOOD: Something was said about you not being a ratepayer?

Witness: I have a portion of what is called the Walk's estate, and I am also the tenant of a property called Huntley's. I pay the rates upon that. It is not paid at present in my own name, because the lady who resides there pays the rates in her own name. I am the leaseholder, and I pay the rent.

By Mr. MICHAEL: My name does not appear on the rate-book.

Mr. *Dugald Campbell*, examined by Serjeant SARGOOD.

I am a consulting gas engineer and analytical chemist. It is impossible to manufacture gas without its being more or less a nuisance. In addition to the simple manufacture of gas, when you come to deal with residual products it is much more a nuisance. It is impossible to carry on the manufacture of residual products without causing considerable nuisance. I have seen the southern site, where it is proposed to erect the gas-works. In my opinion the nuisance I have described would be perceptible in the surrounding neighbourhood there. I could observe, by the way in which many of the trees were bent, that the south-west wind was the generally prevailing wind up that valley. That would carry the effluvia of smoke or smell in the direction of Tunbridge Wells. I visited the north site; it would not apply there. The north site is not open to many of the same objections. I have heard some suggestions made as to sewage-tanks. I did not smell any nuisance at all from the sewage-tanks, either on the north or south side of the town. It was a very warm day and little air, and if there had been any effluvia arising from them I think I should have smelt it, but I did not. As a matter of experience there is no comparison between sewage-tanks properly managed and the manufacture of residual products.

Mr. MICHAEL: Do you mean the committee to understand that going and looking at a tank full of sewage is a criterion?

Witness: I did not see the tanks, only the site. I was 250 yards off the tanks. I did not go for the purpose of examining the sewage-tanks. I did not know the sewage-tanks were there until I went there. Sewage-tanks are sometimes used for the purpose of precipitating and sometimes for the purpose of collecting. If used as a precipitant properly no nuisance could arise. I cannot say what precipitants are employed at Tunbridge Wells.

Mr. MICHAEL: Is it not a fact that when the suillage is removed then the nuisance arises?

Witness: I really cannot tell you.

Mr. MICHAEL: What are the materials that make a nuisance at gas-works?

Witness: First of all, in the drawing of the coke from the retorts sulphurous acid is evolved, and when you quench that coke with water you have steam in which there is sulphuretted hydrogen.

Mr. MICHAEL: To what distance can that be perceived?

Witness: A very considerable distance. Assuming that there was a wind blowing up a valley, that nuisance could be felt 200 or 300 yards off.

Mr. MICHAEL: Supposing Lord Abergavenny had erected coke ovens there?

Witness: It would be different in this respect. In coke ovens all the gas is collected into flues. Generally, coke ovens are not set in a valley or hole; generally they are on the top of a hill. Then they have long flues. The gases are collected into one flue and sent up a chimney, very often in a state of ignition. In the chimneys, 60 feet high, you will very often see the flame belching out at the top. The next thing is in the removal of the purifying materials from the purifiers. It is possible to remove all materials from a sewage-tank without causing a nuisance; but it is impossible to remove them from the purifier without causing a nuisance.

Mr. MICHAEL: If the materials from the sewage-tanks are put down into closed vessels and removed, no injury can take place; and the same would follow with gas-works. You could remove purifying materials from gas-works?

Witness: Yes.

Mr. MICHAEL: What is the difference?

Witness: None, provided you remove it in covered vessels.

Mr. MICHAEL: What is to prevent their using covered vessels?

Witness: None. The next thing is the residual products—the treatment of ammoniacal water and tar.

Mr. MICHAEL: Is it impossible to remove that in closed vessels?

Witness: Not at all.

Mr. MICHAEL: Is it not always removed in closed vessels?

Witness: Not always.

Mr. MICHAEL: Do you mean to say you have ever heard of a case of ammoniacal liquor being taking away except in closed vessels?

Witness: Often and often. Only in small gas-works do they have anything of the kind.

Mr. MICHAEL: There is an immense quantity of ammoniacal liquor. I think you will agree with me it is a valuable product to be sold by the gas company?

Witness: Yes.

Mr. MICHAEL: The more close it is kept, the more valuable the liquor?

Witness: That has very little to do with it; it is simply to prevent a nuisance.

Mr. MICHAEL: Could it be carried away economically without being in closed vessels?

Witness: Quite; in ordinary casks. You may smell it 100 yards off. That is simply the cartage away of these materials; but when you come to the manufacture of these residual products, it is quite another affair.

The CHAIRMAN: Do you consider that the works at present in the town of Tunbridge Wells are a great nuisance, and must be a nuisance?

Witness: Decidedly.

The CHAIRMAN: And that the works ought to be removed as soon as possible?

Witness: My impression is they should.

The CHAIRMAN: You think the sooner they are removed the better?

Witness: They should be as soon as possible.

Mr. WEBSTER: You say the nuisance to which Mr. Michael called your attention was simply produced in the manufacture of residual products on the spot?

Witness: Yes; it is a dreadful nuisance. I do not know whether they do it at present.

Mr. LEWIS: On the whole, would it be best for the town to have these works on the north or the south?

Witness: On the north; there is no doubt about it. In thick weather the products may be collected for days and days; the effluvia would go with the wind up the valley, and no nuisance could be greater. The wind would carry it right up the valley towards Tunbridge Wells, and if the wind suddenly shifted, it would carry it up right into the town.

Mr. ONSLOW: Is the smell of gas unhealthy?

Witness: I am not of opinion it is; but it is unpleasant. I do not know that it would affect health at all, but it is very disagreeable.

The Marquis of HAMILTON: Is the manufacture of these materials a nuisance?

Witness: Very much so. These are some of the most disgusting products that can be conceived.

Mr. *C. G. Cleminshaw*, examined by Serjeant SARGOOD.

I am a consulting gas engineer, practising in Westminster. For fourteen years I have had the management of the Manchester Corporation Gas-Works. I have been frequently consulted on the manufacture of gas. In March, this year, I went down to Tunbridge Wells. I was employed by the Local Board of Health. Undoubtedly, the manufacture of residual products increases the nuisance of gas-works. At the present time I believe they do not manufacture residual products. The north site is not so objectionable from a nuisance point of view as the south. The north site is better than the south, because it is in immediate communication with the source of coal supply from the north—Newcastle. The gas company use Newcastle coals—seaborne coals. They are in direct communication by way of Strood, and from there by railway. All the ports frequented by colliers bringing coals from Newcastle are on the Kent coast. They now use seaborne coals, and they would, I should say, decidedly continue using them, because seaborne coals are better for gas purposes. The South-Eastern Railway passes the local board site before reaching Tunbridge Wells. I have heard the evidence, and in my judgment the company might manufacture next winter with perfect safety. I should say they are quite capable of manufacturing gas there, certainly for the next 12 months. I should say also the next two or three years. I know the local authority have in their hands the sewage and water supply arrangements, and it is desirable that they should have gas also. I think it is desirable that the breaking up of the streets should be entirely in the hands of the local board—in fact, the whole matter should be under their charge. The local board are large consumers of gas as well as being the local authority of the district. I have gone into a calculation of the saving that would arise in the event of their acquiring the gas. If the town had the works there would be a very large saving, both to them and the consumers.

By the CHAIRMAN: I believe they do not manufacture residual products at all now. They are carried away for manufacture.

Cross-examined by Mr. RODWELL: I saw the present gas-works externally I walked in and walked out. I have inquired into the difference of the two sites. I went down about March 23. The price charged is 4s. 6d. or 5s. In my judgment I think that is excessive. I think it ought to be made at a cheaper rate. With proper appliances there would be a considerable saving. It would be impossible to say how much. It has been stated that the leakage is 30 per cent.; it ought to be but 10 per cent. Putting the works in a lower position would save the leakage, but it might be saved where they are. The cause of the leaking is the excessive pressure. I judge so from the evidence given. I cannot say what gas should be supplied at, because the accounts of the company give no information whatever—they do not give the cost of coals, the production, or the price of coke. Therefore, I can give no evidence upon the subject.

The Marquis of HAMILTON: Supposing the local board were to establish their works on this site, would it be necessary for the proper lighting of the town to have gasholders in the town itself?

Witness: It would not be necessary, but it would be more economical to make use of the gasholders.

Mr. BONHAM-CARTER: Would it be any nuisance to the town?

Witness: None whatever.

Mr. BONHAM-CARTER: It is only from the evidence that you gather the price of gas is excessive?

Witness: Yes.

Mr. BONHAM-CARTER: You have no facts?

Witness: None.

Mr. *Upward*, examined by Mr. WEBSTER.

I am a civil engineer, and for 25 years have been manager of the Chartered Gas Company. I have heard the evidence of Mr. Read and Mr. Spice, and the number of retorts they have in use, and I have no fear whatever of them producing gas for another year. I believe Mr. Spice when he said they could go on for five years. I have seen the southern site. I have heard of the nuisance arising from the manufacture of gas and residual products. I do not think works could be carried on at that site without being a nuisance. They could be in the north. If the company are wise they will use seaborne coals.

Cross-examined by Mr. RODWELL: I differ from Mr. Homersham so far as this—he spoke of a certain coal not used for gas making. I disagree with him

upon that point. Newcastle coal is better than Midland. They use it almost throughout England; in all inland places, except in the immediate vicinity of the pits. In some places they use railway coal. In London I should say it was pretty nearly all seaborne; that is in consequenceof getting more gas out of it. They get more coke, and the coke is of better quality, from the seaborne coal than it is from the Midland coal. I am not prepared to say very good coal does not come from Yorkshire, but it is not so good as seaborne. A great deal of coal comes from Barnsley. I have not ascertained the price at which it can be delivered. I should say the cheapest coal for Tunbridge Wells to use would be seaborne coal, because the difference in price of 2s. per ton is more than counterbalanced in the quantity of gas. I was at Tunbridge Wells two days. The works looked very clean and well conducted. I am certain they could go on for another year without change, and with profit. I think they could make a little more with their present retorts. I consider they ought to make 5000 feet per day more, considering the service of retorts. I am not speaking of enlarging their works at all. If they were worked at a little higher temperature they would get more gas. I think they are now making about 5000 feet. I think they could easily make another 1000 feet per day. At the Chartered Gas Company, with a retort only 16 inches instead of 22, I made as much with that small retort as they are making with the large one. I think the present gas-works should be removed. I think they are right in asking to be removed from that spot.

By Mr. WEBSTER: They have 17 beds of retorts at the present time. Mr. Homersham was an inland coal merchant. Although they could get that coal cheaper by the Brighton Company, still it would be better to use seaborne coal. If they could get it, they should continue to use it, whichever side they went.

Mr. LEWIS: On the whole, you think the seaborne coal superior, and that it would be worth their while to have it, even at the difference of price?

Witness: If 2s. is the limit, it would be better.

Mr. LEWIS: As a rule, do gas companies prefer that kind of coal?

Witness: It produces more gas, and gas of a better quality.

By Mr. BONHAM-CARTER: I went to Tunbridge Wells on April 18 and 21. I think I went to the northern site and the southern site. I did not then consider the question of pressure as between the two sites, but I have since. There would be hardly any difference at all as to pressure. I believe the nearest house to the southern site is 300 yards off. I think if you manufacture the residuals there will be a decided nuisance, which will be felt at a distance much greater than 200 yards. There are some very bad gases produced in the manufacture of residual products—sulphuretted hydrogen, a deadly poison. There are sanitary objections to the manufacture of residual products there.

The Marquis of HAMILTON: At what distance could the effects be felt?

Witness: Many hundred yards. The Chartered Gas Company were obliged to give it up.

The CHAIRMAN: They were surrounded by habitations?

Witness: They were. The north site is some considerable distance from any dwelling.

Mr. *George Wilson Stevenson*, examined by Mr. WEBSTER.

I am a gas engineer, of Great George Street. I have, for some 30 years past, paid great attention to the construction of gas and water works. I have been at Tunbridge Wells, for the purpose of inspecting the place, with special reference to this inquiry. I have seen the site selected by the promoters for their new works. I should say it is a bad site in every respect, both in regard to position as regards the town and in an engineering point. It is south-westerly of the town, and in a gorge. The prevailing winds are south-westerly throughout the kingdom, and in a damp state of the atmosphere the fumes from the gas-works would certainly be carried up the valley and into the houses in the town, and into the best houses, because they are on the south side. Then, with regard to the selection of the site from an engineering point, it is unsuitable, because of the variation of levels, which is very considerable. A considerable brook-gorge runs through the property. That will have to be arched over, and the whole of the site will have to be brought up to something like a uniform level. The manufacturing part of the works must all be on one level. Unevenness of surface is a great disadvantage to works of this character. My attention was also directed to the northern side of the town, where the local board put their site. Of course, the two sites are opposed to each other here, and it may appear that I am giving partial evidence; but I say the northern site is as favourable as the other, contrasting it on the point I have mentioned. The fumes of the gas-works—and there are fumes given off, especially during the change of purifiers—would be carried away from the town. The works would be upon an open plateau, where the fumes would be immediately dispersed by the winds, because I do not believe in their being broken up or absorbed by trees. The north is a site I should have selected in preference to the one selected by the promoters. It is not subject to the same objections with regard to the levels and foundation. As compared with each other, I should say the southern is the best end of the town; the northern site is on the poorer side of the town—that is, there is no residential property of any value. The southern site is the romantic site. I have seen and admired the High Rocks; no one would think of going to Tunbridge Wells without going there. I do not mean to say that if another site could not be found, it would not be wise to put the works there, but if possible they should be put elsewhere. I have turned my attention particularly to the question of pressure, and have heard what has been said on the subject. In either case, whether you took the works to the north or the south, the level would be the same; they will have to get over the summit of the hill, they cannot go through it; they must have a certain initial pressure, which will accumulate as the gas rises to the top, and decrease as the gas descends. There is a small advantage in regard to the supply to the south side, and that is, there are more houses to be supplied on the south side of the summit than on the north side. To that extent there is an advantage, but when I have said that, I have said everything I could say in favour of the southern site. It would involve a slightly longer main to be put down from the northern site at a cost considerably less than £1000, and that would compensate for that. I certainly do not consider it advisable that they should quadruple their capital. That is not at all necessary. I think this bill is premature, that there is a large surplus of power on the existing works which ought to be used up in the interest of the company. I think the company should go on for the present using up their surplus power, and then, when pretty nearly exhausted, they ought to see about removing. That might be some ten years hence. The extra mile radius of supply would involve an extension of capital and works, which I not think at all necessary. It doubles the area of the company. I do do not consider it advisable for them to go further afield, or if they did there should be a differential rate of price, so that consumers of gas in the more thickly populated districts should not be called upon to pay the dividend on the unproductive capital expended on the outside, if they went to places which would not remunerate them; they would otherwise have to screw up the price of gas. I have been very much concerned with the question of the acquisition of gas-works by local authorities. I think it is advisable both to the public and the consumers that the local authorities should have the gas-works. The advantages are to the public that the roads are not broken up at the pleasure of a private company, and it can be supplied at cost price, and any profits arising from the supply of water or gas to private consumers would be applied to the reduction of the rates, or effecting public improvements. To consumers, the expenses of management will be less; there will be one accountant, one collector, one secretary, who have all the business of the local authority. There are no directors fees, and, as a rule, corporations pay less salaries than companies do. I attribute it to this—they have to justify their expenditure to the ratepayers; they have to go before their constituents every three years, and if they pay salaries the public think too high, they get dismissed. I have known councilmen rejected for voting large salaries to officials—which the outside people thought to be large. But there is a much more important reason why gas and water undertakings ought to be in the hands of local authorities. There is no inducement for local authorities to expend capital unnecessarily. The inducement to a company is to get 7 or 10 per cent., whatever their statutory dividend may be, upon what capital they spend. Local boards may borrow at 4¼ or 4½ (I am now speaking of principal), while companies get money at a higher price. I know this company have suggested the raising of money by 7 per cent. shares, and I was quite astounded to hear it suggested. A local authority is responsible to the public. With regard to this question of gas and water, there are now more than 100 gas undertakings which are in the hands of local authorities, and a great many more than 100 water undertakings. I did not go over the works at Tunbridge Wells, but, from what I have heard, I am quite sure they can go on for a couple of years longer, and go on well and economically. The distance at which any noxious smell can be clearly perceived is somewhat difficult to define. I live in Kensington, and am very much troubled with the sulphur which comes from the Fulham works, about a mile and a half distant; and I am instructed at the present time by the vestry to call on them to abate the nuisance. It is quite impossible to carry on gas-works at all without creating an offensive smell in a neighbourhood. It may be reduced to a minimum by good management, but even the minimum is a nuisance—it is so recognized by Parliament. They are debarred from manufacturing residual products at Fulham; but what we suffer from is at the period of time when they change their purifiers. Sulphuretted hydrogen is brought across into the houses, and the consequences are serious, for it turns the silver nearly black.

Cross-examined by Mr. RODWELL: Standing Orders prescribe 300 yards as the distance around which companies are required to give a notice. I think it desirable that these gas-works should be put into the hands of the local authorities. They make a little more gas at the Imperial than they do at Tunbridge Wells.

Mr. RODWELL: You have been generally engaged in attacks upon gas companies. I have seen you in most rooms with competing schemes, and jeering at gas companies.

Witness: I am as much engaged on one side as the other. I have consistently taken the same line. I have not been over the gas-works at Tunbridge Wells. I have not said one word about your gas-works.

Mr. RODWELL: Do you complain of the price charged?

Witness: I have not said anything about it. I really do not know what the price is.

Mr. RODWELL: You have no complaint whatever to make against this company?

Witness: Not the slightest, and I think you ought to remain as you are and where you are.

Mr. RODWELL: Not to be removed?

Witness: Not for the present, not until you have exhausted the producing power of your present works.

Mr. RODWELL: What time will you fix for that?

Witness: Two years, without spending any more money.

Mr. RODWELL: How long do you think it would take, then, before they could move?

Witness: Less than 12 months. That would not be very expeditious. I erected a gas-works in Wales in five months. The time given by Act of Parliament is for the acquisition of land. I do not think it desirable this company should remove at once. They may not get their powers until next August or July, but the works need not be moved. I think this bill is premature on account of reserve of power in the existing works; they can go on very well for two years.

Mr. RODWELL: Assuming the site was good, would you not tell the committee to pass the bill?

Witness: I do not say that I should.

Serjeant SARGOOD: That is our case.

Mr. RODWELL, in addressing the committee, said his learned friend Serjeant Sargood and his witnesses seemed to admit nearly the whole of the promoters case, and it would appear now that the point to be determined was narrowed to a very small compass. After the evidence of Mr. Stevenson, who had stated that if it were not for the site he should recommend the passing of the bill, the whole matter upon which the determination of the committee would have to be founded would be the question of site. He was not going to argue that question at any length, and if he read through the evidence it would be detaining them wantonly and unnecessarily. He regretted that, through an accident, this question of site had been raised at all, for it was not a question he had alluded to in his opening with any great stress, and he was not prepared at all to enter into its merits. But, unfortunately, in the excitement of the moment, a question was put which justified the committee in arriving at the decision they did. However, he had it now to deal with, and, before dealing with that portion of the case, he could not help reminding them of the very peculiar character of the opposition to the bill. They had had a great deal said by some of the witnesses as to the injury likely to be sustained by the inhabitants of Tunbridge Wells, the inconvenience that would be felt by the change of sites, &c.; but on this subject the promoters had called six professional gentlemen of experience, each of whom spoke in the strongest possible terms of the advantageous position which the company had selected for the purposes of new gas-works. When there was a variance of testimony, it was, of course, for the committee to consider to what they were likely or disposed to attach the greatest importance. The promoters witnesses had all given their evidence under some feeling of responsibility—they were the advisers of the company. The company had selected that site because it was the best; whereas, on the other hand, the oppositionists attended to find fault without any responsibility whatever. Supposing there were at that moment two competing schemes at Tunbridge Wells, each ready to supply Tunbridge Wells with gas, it would become necessary to show which was really the best site, but here they had no responsibility attaching to them. He did not care why the northern site had been selected, whether it was because the board could get it at less expense or not; at the same time he should not go into a comparison of the two sites. His learned friend, Serjeant Sargood, had admitted that it was desirable that there should be a bill of some kind or another, and that this bill, in many respects, was desirable.

Serjeant SARGOOD: I admitted that the time will come when you must move, and you ought not to remain in your present position.

Mr. RODWELL thought his learned friend would go with him as to the question of time. Could the committee, he asked, place the slightest reliance upon the last evidence? Mr. Upward stated distinctly, as a competent man, that the works should be speedily removed, but Mr. Stevenson would not give a decided answer; and when he was asked the reason, it was simply because they can stop there for two years. He would ask whether the company were not acting as prudent men in asking (although possibly the work might be done in 12 months, but considering the price of material at the present moment, and the upward state of the labour market) that they should be allowed 36 months. The question of time was, he thought, clearly disposed of. He would next allude to Mr. Campbell's evidence, who said that the works should be removed as soon as possible. And what did the local board do when they first heard of the

matter? Stated that the present works ought to be removed. The whole of the evidence, therefore, as to time was in his favour. The company had not done a single thing which called forth a complaint. They had conducted themselves so well that even clever Mr. Stevenson, who was the first to pick holes and discover any malpractice, or any sort of deficiency, had not a word to say against them. Mr. Browell was clearly a witness in his favour upon this point, and he must say he never knew an opposition case so weak. But was this a genuine, *bonâ fide* case of opposition? He was not going to indulge in any offensive observations, nor would he detain the committee with any comments of his own on the conduct of the local authority and Mr. Heugh. He would only say, and he said it advisedly, that it was a prostitution of the position the local board held in the town of Tunbridge Wells that they should have lent themselves—because that was what they had done—as a power of opposition on behalf of an individual to harass the gas company, of whom the local board could not and did not complain, and against whom they had not one word to say.

Serjeant SARGOOD: There is not the slightest evidence which justifies you casting such a slur upon us. Mr. Heugh has been heard.

Mr. RODWELL did not blame Mr. Heugh. The local board did not appear as the representatives of the ratepayers in the question, and it was not a *bonâ fide* position for a local board to be in. These gentlemen had not got the powers which the Municipal Corporations (Borough Funds) Act required, and the approbation of the ratepayers. They had, therefore, taken advantage of their being a local authority, and supported an opposition which had to be paid for in some other quarter, and therefore no weight should be attached to their petition. Except in the case of the Rotherham Gas Company, where their prices had been advanced, he had not heard of even indirect pressure being put upon gas companies to compel them to sell, and he was quite sure no such pressure would be put upon this company. Dwelling upon the fact that the oppositionists had not brought forward a single independent witness, he again alluded to the conduct of the local board, and concluded by respectfully asking the committee to pass the preamble of the bill.

After a deliberation of nearly an hour,

The CHAIRMAN said: The opinion of the committee is that the preamble is proved.

Serjeant SARGOOD: As there is another, I will not say better, place, I will not trespass upon you further.

The committee then proceeded with the clauses, and the chairman was ordered to report the bill to the House.

Legal Intelligence.

GENERAL ASSESSMENT SESSIONS.—WESTMINSTER, FRIDAY, MAY 1.

(*Before Mr.* EDLIN, *Q.C., presiding, and other Commissioners.*)

THE GOVERNORS AND COMPANY OF THE NEW RIVER, APPELLANTS, *v.* THE ASSESSMENT COMMITTEE OF ST. MARY, ISLINGTON, RESPONDENTS.

Mr. POLAND was counsel for the appellants; the Hon. A. THESIGER, Q.C., and Mr. BESLEY appeared for the respondents.

Mr. POLAND, for the appellants, said the original rating of the appellants property was £11,250 gross, and £9000 net, by the list which was in force from April, 1871, and which was binding for five years, but subject to any alteration taking place in the value of the property. By the supplementary list of last year, the value of the property was increased by £1350, making the gross value £12,600, and net £10,500. A discussion took place as to these terms, when it was elicited that the original list was binding as regarded the old property, and that the parish was only entitled to an increased valuation on the new property. The increase was therefore £480 gross and £400 net. The only matter that remained was to ask for costs.

Mr. THESIGER, for the respondents, said each party was wrong to a certain extent, and therefore he thought each party should pay its own costs.

Mr. POLAND said that litigation had become necessary by the company, in consequence of the parish putting such an exorbitant increase on the rating.

The CHAIRMAN said the respondents had proceeded in a wrong manner, and therefore the appellants were entitled to their costs.

Miscellaneous News.

THE NEW GAS COMPANY, LIMITED.

The First Annual General Meeting of Shareholders was held on Thursday, the 30th ult., at the City Terminus Hotel, Cannon Street, London—the Right Hon. Lord CLAUD HAMILTON in the chair.

The SECRETARY (Mr. Henry Brownrigg) read the notice convening the meeting, and the report of the directors, as follows:—

In presenting to the shareholders the first annual report, the directors have to state that in practically introducing the company's patented process on a large scale, certain difficulties arose taxing the patience and resources of those concerned. Much time, labour, and expense, have unavoidably been incurred, in overcoming the difficulties encountered, but your directors are happy to say that the experience gained at Chichester has abundantly confirmed the general statements, upon which all the expectations of the company were originally founded as to the character of the gas produced, and its applicability to modern requirements.

Its purity, brilliancy, and permanency are all fully established, the only drawback being the greater expense from wear and tear of the retorts beyond the original estimates, which could alone be ascertained by lengthened experience. A remedy for this additional expense having been discovered, has been patented by the manager, and your directors have reason to believe that in a very short time the difficulty will be satisfactorily surmounted.

The West London Junction Gas-Works have recently been purchased by the company. These works have supplied the Great Western Railway Station, at Paddington, and the Great Western Hotel with gas for some years. They are now being adapted to the production and supply of this company's gas, and within a month from the present time it is confidently anticipated that this extensive station and hotel will be entirely lighted up, and afford proof to the world of the commercial success of the new system.

An agreement has been entered into by which the New Gas Company have permission to erect apparatus at the works of the Crystal Palace District Gas Company at Lower Sydenham, upon terms securing the permanent adoption of the New Gas Company's system as a means of supply to the district so soon as its efficiency and economy are established to the satisfaction of the Crystal Palace District Company's engineer. Works are being erected under this agreement.

Your directors have also entered into arrangements with the Foreign and Colonial Gas Company for the introduction of the new system at Tunis, where coal gas-works are in so forward a state that the company's local manager anticipates lighting up within two months. As the population of Tunis is about 150,000, of which 40,000 are Europeans, this is regarded as a favourable opportunity of proving to foreign gas companies the economical advantages of the new system, where the cost of coal must necessarily be high. The new gas will be able to be supplied in about six months, and this company is to receive a per centage upon all gas supplied.

Your directors have only to add that nothing has occurred to shake the confidence of the general manager in the speedy and permanent success of the undertaking, and that this confidence is shared by the consulting engineers of the company.

With reference to the foreign patents, negotiations are far advanced for the sale of the French, Belgian, and Danish patents for a large sum of money. The directors are only waiting to see the result of the improvements at the West London Junction Gas-Works to sign agreements for the sale of these patents.

Agencies have been opened at home and abroad to forward the interests of the company.

In accordance with the Articles of Association, all the directors retire from office and offer themselves for re-election.

The auditors, Messrs. Quilter, Ball, and Co., retire, and offer themselves for re-election.

The CHAIRMAN, in moving the adoption of the report, said: Gentlemen, I wish to explain to you the reason of our meeting being convened at the present time. Many of you may think that this meeting has been summoned rather hastily. Well, it arose in this way. Some of you no doubt were present last year when we met on the 24th of May, and it is so universally the usage that the first annual general meeting should be held within a year of the first or statutory meeting of the company, that we were under the impression that we could hold our meeting any time in May; but when the time was drawing near, on looking to the Articles of Association, we found that owing to the omission, on the occasion of our last meeting, of naming May as the date of our meeting this year, we were bound by our articles to hold our meeting in either March or April, and so we found ourselves under the necessity of issuing the notice and drawing up and presenting this report to you in a somewhat hurried manner. Thus you will see it was entirely owing to the accidental omission of somebody moving at our meeting in 1873 that the meeting this year should be held in May, that we were obliged to call you together in April; and this, as you are aware, is the last day of the month. Now, gentlemen, in bringing to your notice the contents of this report, I must tell you what it already states, that we all regret that we have not been able to present to you a more complete result of the operations of the company. All of you, now doubt, gentlemen, being more or less practically acquainted with works of this kind, are aware that as you develop a new system, you, in the course and progress of finishing the work, find out various improvements and various adaptations which did not occur to you at the first moment, and of course on each occasion when you have discovered a process whereby great economy and other advantages may be secured, you are bound to adopt it and adapt your machinery and the works you are carrying out to the new discovery. And this is the real history of the delay which has occurred in bringing out this new system of gas making. Last year I was able to state to you that the operations at Chichester had led to the conviction that we were in possession of a most valuable discovery, and everything that has transpired since that time has completely tended to confirm that impression. But after a certain period of work at Chichester, we found that there were certain difficulties which only lengthened experience could exhibit and develop, the remedy of which required the closest and most earnest attention—namely, the rather rapid deterioration of pipes within the furnaces, and the liability to derangement of the retorts as they were then constructed. And therefore of course it became the duty of those who are superintending our works—the scientific gentlemen who are engaged in the service of the company—to endeavour to bring their talents to bear in remedying this defect and inconvenience, and, of course, as you will readily understand, these things must be done slowly, and require a considerable amount of time, even when you have discovered the best method of curing the ascertained evil. You are aware, of course, that it would be extremely rash to rush into any considerable outlay until you have ascertained what is exactly required. Now, we have secured the services of the most eminent men with regard to the manufacture and composition of gas, and also with regard to the engineering details connected therewith. And they are both satisfied that they have fully got hold of the difficulties that have been encountered; but they personally will explain to you the reason why we have not as yet been able to invite you to come and see the system in successful use. We had hoped, and indeed until quite recently we thought we should have been able to do so, had the meeting been held in May; but, as I have already explained to you, we could not delay this meeting beyond the present date. Now, I am sure you will all feel that, although I have the honour of being the chairman of the company and of presiding on the occasions of your meeting, when we have to speak to you of strictly scientific matters I had better refer you to those gentlemen who are charged with the management of the works, for any information on such points. Therefore, I trust you will not expect me to go into those scientific details, which will be so far more fully and aptly communicated to you by our manager and engineer. I wish to remind you how very important any scheme, such as that which this company was formed to develop, is at the present period, because you must be all aware how some of the leading gas companies in London have been of late applying for, and, after a considerable struggle, have obtained permission to raise the price of gas, thus showing the enormous advantages that will be derived from this system, which will, we expect, lead to the production of gas at a much lower rate than any existing company can produce it at. As the report tells you, we have undertaken to light up the Crystal Palace, which we considered would be a most favourable opportunity for exhibiting to the world the efficiency of our gas. But, inasmuch as, after we had undertaken that work, the discovery and invention of the new formation of the retort was hit upon by our general manager, we deferred carrying out that undertaking until we had thoroughly carried out the new system at the West London Junction Gas-Works. And the reason for so doing is this: At the West London Junction Gas-Works we have complete privacy and control over the works, whereas at Chichester we had only a portion of the works, and Mr. Church, the manager of the Chichester Gas Company, had full command of the premises. And in the same way we had not complete command of the premises at the Crystal Palace District Gas Company's works; but at the West London Junction works we have complete control, and can carry out in privacy all the arrangements we desire to effect. Therefore, under those circumstances, all other operations have been suspended, and await the success which we confidently believe will attend the operations at the West London Junction works. And that is the reason why we point out to you that we have operations going on at several places, but that at only one they are being pushed actively forward for the purpose of exhibiting the advantages we assume will be derived from our system. The interest that the public feel in our success is very conclusively demonstrated by the number of applications we have received, both from gas companies, from foreign associations, and from private individuals. But, of course, we have been obliged in all cases to say that we were not prepared at present to enter into any negotiations as to terms with them; but the moment we are able to establish the complete success of our system, we shall open definite negotiations with all those parties who have communicated with us on the subject. As the report tells you, negotiations are far advanced for the sale of the French, Belgian, and Danish patents, which promise to be a source of great profit to the company, and we have also had communications with a great number of other Governments, with the view of our entering into negotiations with them. But those are rather matters for the future, and at present we await, as I have stated, the exhibition of success at the West London Junction Gas-Works. Now, I do not like to detain you with many observations, because, as I have stated before, all practical points which you may wish to raise will be met and replied to by those competent gentlemen, Mr. Spice and Mr. Quick, our general manager and engineer, who are present. I have no doubt many of you will consider, and, perhaps, be prepared to criticize, the amount of the company's expenditure as excessive, and I am not at all surprised at it; but I wish to point out to you that, in a case like this, the heavy expenditure is at first, and not at last. It must also be borne in mind that, in order to carry out a scheme of this kind, we were obliged to secure the services of the most able men in London; and, let me tell you, these men will not give up their valuable time and attention to the interests of the company unless they are tempted to do so with high salaries. Now, those expenses, to a great extent, will not occur again; because, as I have said, the heavy expenditure is at starting. I am sure nobody can desire more than I and my colleagues do that the working of the company should be conducted on the most economical principles; but it was absolutely necessary that these expenses should be incurred. Once fairly started, however, and the value of the company's system satisfactorily established, they will be at an end. All our difficulties will be over, and the great necessity for that outlay will cease. The

number of the superintendents and so forth will at once disappear from the balance-sheet, and the expenditure under that head, therefore, done away with. I wish to state that at once, because I know and feel that everybody who is interested in the company must consider that the expenses, in that respect particularly, are very large. As I said before, it was necessary that this outlay should be made in order that you should secure the services of the most eminent men; and, as everybody knows, that cannot be done without heavy expenditure. I do not say that, however, with the view of deprecating criticism, because I feel and desire that these matters should be open to discussion, and because I feel confident that we can afford you a satisfactory explanation of all the items set forth in this statement of accounts. I do not like to detain you longer, gentlemen, because our general manager and engineer will meet and answer any observations and questions which you may wish to ask; and I always think it is better to give any information that is required in reply to observations than in opening remarks of a general character. I shall, therefore, now conclude by moving, as a matter of form—"That this report and statement of accounts be adopted."

Mr. H. W. Spratt: I beg to second the resolution for the adoption of the report. I think, after the remarks of his lordship, it would not become me to detain you here with any observations of a general character, but I would wish to call your attention to the fact that gas is an essential now almost of our existence, and, therefore, when any improvement can be made, either in the cost of its manufacture, or in its purity or brilliancy, I think such an improvement would well recommend itself to the English public. But when you have to deal with the English public, you have to deal—and I think very properly, especially in the case of new inventions—with a vast amount of prejudice, and you have to overcome that prejudice, and I think that can only be overcome by time. First of all, an experiment may be very successful in a room, but it by no means follows that equally satisfactory results will be attained in an hotel like this, and it would certainly be a dead failure in a town. We, therefore, thought that a trial at Battersea, ranging over some hundreds of lights, would be a sufficient test of the value of the gas, by which we could tell whether this gas would be a success or not. And to all appearance it was a success until we tried it at Chichester, and there we found that the difficulty we had to contend against was the difficulty of the wear and tear of the retorts. That difficulty is believed to be now overcome by those gentlemen, who, from their practical acquaintance with the subject, are competent to form an opinion on the point. Personally, as far as I can judge of the theory of the thing, I believe that it will be successful. That is one of the objections attachable to all new inventions; another difficulty that a new company or enterprise has to contend against is vested interests—and the gas interests of this country are very large indeed. Whenever you attempt to introduce any improvement, there at once you are met with all sorts of difficulties, and you have to satisfy such an amount of prejudice, and refute such a mass of objections, that it becomes a very wearisome task indeed. We thought the lighting up of Chichester would be a proof to the world, because we invited the heads of nearly all gas companies in the kingdom to visit Chichester and witness our system in operation. Well, the representatives of those gas companies who attended formed themselves into a committee, and tested it; and I believe the result of that examination was considered to be satisfactory. But these things die out of the attention of the public and those more closely interested in the matter, and we have continually to urge gas companies to listen to our propositions. And then we found that the going down to Chichester, two hours there and two hours back, was considered such a task that, although we were willing to pay the expenses of the journey, we could hardly induce many people to go down. Accordingly, the cry was, "Come nearer London; do not take us to Chichester." And I may mention that, in negotiating for the sale of the French patent, we invited the intending purchasers to visit the town and see the gas for themselves. Thereupon, the question was put to us, "Where is Chichester? If this be a good thing, why not come to London, and use it there?" Well, after some time, we came nearer London, and were able to make arrangements with the Crystal Palace District Gas Company; but, very shortly after that, we found we were not at liberty to make certain experiments to test the system in the way we should like. And let me remark here that it is our earnest desire and determination to test the gas in every possible way, because, if there be nothing of value in it, the sooner it is put an end to the better. Accordingly, we turned our attention to another field of action, and some little time afterwards, the West London Junction Gas-Works were purchased by the company. There the enormous station (the Great Western, at Paddington), and the hotel will afford us an ample opportunity of proving to the whole world, not only to gas consumers, but to the public at large, the advantages possessed by our system. When the new gas is seen night after night lighting up those premises, I think it will be such a lever, that when gas companies do not declare the ordinary 10 per cent. dividend, the shareholders will say, "Why do not you use the new gas process?" and that really is the great object we had in view in making experiments in London. I say of necessity, "experiments," because I do not suppose for a moment that we have attained perfection in the manufacture of gas. I believe there is a great deal more to be done in the way of improvement in every respect. Our general manager, whose opinion is law, to a great extent, with regard to these matters, will, I think, be able to satisfy you that these works are going on thoroughly up to the mark; and when the shareholders can go and satisfy themselves that this thing is not a sham, but a reality, and in *bond fide* operation, I do not think it is worth while to tax your patience any further. I should, of course, have been very pleased to have come here to-day and told you that we had got a dividend; but remember, gentlemen, this is our first year, and agreeable as that would have been, it was scarcely possible that such a result could have been attained. Take the case of any gas company—during the first twelve months they are engaged building their works; or even the case of an ordinary commercial enterprise—during the first year they are forming a connexion and laying the foundation of a business; and so in the same way it has been with us. I may say I am not at all pleased with the appearance the accounts present. We have put all the details of expenditure before you, so that you should not be able to say, "Here is a large charge of £5000 and no particulars stated;" but that you should see how that sum of money has been spent. When I tell you that we have had a great deal to do, and that we had £100 a year each, I think you will not consider that we have been over paid. No doubt the gentlemen before me can tell whether the salaries we are compelled to give our officers are excessive or not. I may tell you that those expenses, on the completion of our works, will be to a great extent done away with. With regard to one of the charges, £956 for superintendents, I may say that one of those gentlemen is out at Tunis. We had first to educate him to this particular work, and he is now out at the works. We shall want one at the Crystal Palace, and another at the West Junction works. And in every case it is necessary that we should first educate these men to enable them to carry out this scheme. Immediately, however, the system is adopted, those expenses will fall upon the companies adopting our system. I trust, therefore, you will think that, considering the trying circumstances in which we were placed in introducing a new system of gas making into this metropolis, and having regard to the difficulties with which we have been surrounded, that the expenses incurred during the past twelve months are not excessive. And, gentlemen, we look to you to support us in carrying out this undertaking to a successful issue. I believe there is only one feeling animating the board, and that is to reduce expenses and push your interests. As soon as these recent improvements in the manufacture have been carried out, and the process established a success, we shall proceed with the sale of the French and Belgian and Danish patents, in regard to which we have already opened negotiations. And the price or terms of those sales are such that I am sure, if we succeed, you will be satisfied with the result. From the proceeds of those sales we shall be able not only to pay you a dividend for that year in which the transactions may take place, but for the back period, if you should think it desirable so to do. I think I will now conclude, without further comment, by simply seconding the resolution for the adoption of the report and accounts.

After some remarks from Messrs. White, Darvell, and May,

The Chairman said: I think it would meet your wishes, gentlemen, if, instead of my replying to the observations that have been made, you should hear the views of our scientific men. My opinion is that the system will prove an undoubted success; but, then, what is my opinion worth?

Mr. R. P. Spice (general manager): My lord and gentlemen, I have not been at all taken by surprise by the adverse criticisms made, and made, I am happy to say, in a fair spirit. There may have been some little feeling exhibited in giving expression to those terms of dissent and those complaints by the two gentlemen who have spoken on the subject; but they have, of course, a perfect right to express their opinions in their own way, and I am glad they have done so, because it affords me an opportunity of giving an explanation, which will enable me to put a better appearance upon that which, I admit, does not look very satisfactory. Gentlemen, I have a reputation to maintain or lose, and the loss of my professional reputation would be a very serious matter to me. I may say, without boasting, that I have been looked up to now for many years as an adviser upon gas matters. I have had the honour of appearing for many years before parliamentary committees, and I think I may say that my judgment is considered, on the whole, something to be relied upon. Having regard to those facts, therefore, you will readily understand that I did not enter into this undertaking in a thoughtless or careless way. When my friend, Mr. Quick, joined me in giving a certificate to those gentlemen who had great faith in the system, we joined the affair with great caution, and after having examined every detail of the system according to our experience, so far as it had then gone. We then believed that the wear and tear would not exceed 4d. per 1000 feet for retorts. Our further experience resulted in difficulties in regard to the duration of those retorts. One thing brought out another, and having discovered those difficulties, they were, I assure you, the source of very great anxiety to us, we being constantly led on with hopes that were as constantly disappointed, because those hopes were founded on alterations of the way in which the retorts were then set and worked. There were reasons, which appeared to be satisfactory, to lead us to believe that, if certain arrangements were made, those retorts could be made to last longer; and then, the system being new, we felt that a certain portion of our difficulties was due to its novelty, while we were also convinced that our failure was to be partly attributed to the nightmen not keeping up the heats to a uniformity corresponding with the day work. I mention these little matters of detail with the desire of giving you, who are strangers to the process, a clear idea of the nature of the difficulties we have had to contend with. Large expenses were going on at the same time, which caused us no small anxiety, because we felt that our credit was at stake, and that we were spending your money. At the same time, it is true that we were spending our own money also, because we have backed our faith in this concern to the extent, between us, of £6000 to £7000. I am the holder of the company's stock to the value of £2000, and my friend, Mr. Quick, is the holder of some £4500, and we have each of us many friends, shareholders in this company, who have embarked considerable sums. Several personal old friends have appealed to me as to what I thought of the value of the system, and I have said to them, "I have faith in its success, though of course all these things are to a certain extent speculative until fairly tested and proved." They then said, "If you have faith in it, and have invested in it, we will also go in." Therefore, we are not merely as the paid officers of the company, but men who have a stake in the concern like yourselves. Now, with regard to these retorts. When I found it was utterly impossible to maintain the retort of the shape of the letter D (spoken of as the D retort) because of its cracking (the cause of which, as we subsequently found, has been that we have been putting steam into the retort, and so reducing the heat within, while maintained without, and we could not regulate that in any way), it occurred to my mind to have a cylindrical retort set vertically. Therefore, the new mode of making this gas is by settings of vertical iron retorts of a cylindrical shape, and I have every reason to believe that by that means the difficulty we have hitherto had to contend against will be met and overcome. I have not put my hand in the company's pocket for the purpose of defraying the expenses of patenting this last invention, but I have taken out a patent for it at my own expense. If it fails I shall be the sole loser; and if, on the other hand, it proves successful, the company will be charged but a small per centage for it. And those retorts and that apparatus are now set up at the gas-works at the West London Junction works, and any gentleman is at liberty to go and see them for himself. The works are not quite ready for operation, but it occurs to me while speaking that if any gentleman likes to go and see them, we shall be most happy to receive him. In a week we light the fires, and within a month I believe these works will be in action, and the Great Western Hotel and Station will be lighted by the gas as we send it out from these works. It has been said all these things are experiments. The works at the West Junction are not so, except as regards the duration of the retorts. This company has bought those works, and contracted to supply the station and hotel with gas for some seven years. The price at which the gas has been supplied hitherto is 2s. 10½d. per 1000 feet, but owing to the high price of coal of late they could not make ends and sides meet; but I am quite satisfied that we shall make a profit where the old company failed to make one. And my friend reminds me to mention that we have backed up our opinion again by giving a guarantee to the company that there shall be a return of at least 5 per cent. on all the money spent on those works.

Mr. White: Is there any penalty for non-completion of that contract?

Mr. Spice: There is no penalty.

Mr. White: Suppose you fail to do it?

Mr. Spice: Then they take the works. The works are held upon leasehold property—held at a nominal rent—and it is our opinion that the works will be worth as much at the end of the six or seven years as we have paid for them. We have bought them at less than their strictly market value, so that we have only to keep the plant in proper repair in order to more than recoup the company for the money laid out. Part of the purchase-money has been paid in shares of this company. Between £15,000 and £16,000 has been paid in all, partly in cash, partly in taking over liabilities of the vendors, and partly in shares of our company at par, to the extent, indeed, of £5580.

A Shareholder: And how much in money?

Mr. Spice: About £6000 to £7000 altogether. And I should also mention the payment of the whole sum is spread over a period of six years. We shall have the whole of it back. The money will all come back, so far as our judgment extends. Therefore, as I have said already, the only thing that can be called experimental with regard to the West Junction works is as regards the duration of the retorts. And if I did not believe that the recent improvement we have effected with regard to the construction of the retorts and the general arrangement would be a success, I should not have incurred the expense of taking out a patent for it. I should have said this wear and tear is so much more than we had reason to believe at first, that it is not worth while continuing those experiments any longer. But, gentlemen, we believe that we have overcome this difficulty of wear and tear. Then, as regards our works at Chichester, they were so far satisfactory that we were able to prove that we could manufacture and supply this gas, and that it was brilliant and pure beyond what coal gas generally is. And, with regard to the nature of that contract, there never was any idea of supplying the gas to the town permanently; the works were simply handed over to us for 12 months for the purpose of illustrating our system. I invited hundreds of gasmen and others to come and see it in operation; and, on one occasion, the gas world was certainly well repre-

sented, and then the process and results were witnessed with feelings of surprise, and by some of those gentlemen with admiration. Here and there I have met with a sneer from my professional brethren, but that will always be the case with a new thing. And then, some men may say with regard to myself and the opinions I have expressed as to the value of our system, "Oh, he is interested in it, and he must stand up for his company;" but, gentlemen, I can tell you this, I am perfectly satisfied of the truth of what I say when I state that the gas world is looking to this invention with very great interest and attention. I have had men come here from Scotland and abroad, and they have gone into the details of the thing, and they have gone away astonished at the good points of the system. Now all we want to ensure success is that which we have at our fingers ends as it were—the maintenance of these retorts, so that their durability will result in the cost of wear and tear being within the sum originally calculated—that is, 4d. per 1000 feet. My hope is that it will be less. This has been my study night and day, and indeed I am only just recovering from an illness brought about by overwork, chiefly in the interests of the company. With regard to our operations at Tunis, we have advanced to the Foreign and Colonial Gas Company £5000, for the completion of the works in the course of construction there, which is secured by a first charge upon those works, registered in the regular way by the British consul. Upon that property the Foreign and Colonial Gas Company have already expended something like £40,000; and although some of that amount doubtless represents useless expenditure, still I have from our own manager there certain details which enable me to assure you that the property cannot be worth less than £20,000; so that you will see this company is amply secured for the advance it has made. In the course of about a month I expect that we shall find that Tunis is supplied with coal gas. I should tell you that the Foreign and Colonial Gas Company are to pay us 8 per cent. on the advance we have made to them, and a royalty of 6d. per 1000 cubic feet upon all gas manufactured at Tunis, whether coal or water gas. That royalty will extend over a period of some years. When the money (the loan of £5000) is repaid, we shall still be entitled to a royalty upon every foot of gas manufactured at Tunis.

A SHAREHOLDER: For how long?

Mr. SPICE: For 14 years. The proposition that the Foreign and Colonial Company made to this company was, that we should have a royalty of 1s. per 1000 cubic feet upon all the water gas manufactured at Tunis, and those terms were agreed upon between the two companies; but I was away at the time, and on my return from Ireland I said, "No, those terms won't do," for they might not find it expedient to make half water gas, and therefore, supposing but a quarter of the supply was made of water gas, our royalty would be very small. So I said, "Call the shilling sixpence, and let the royalty be spread over the whole of the gas manufactured." You see, it is so far out of the way that we cannot go and ascertain how much gas they were making by the one process and how much by the other without great difficulty, and therefore it was arranged that 6d. is to be the royalty upon all gas manufactured at Tunis during the next 14 years. But, gentlemen, that royalty of 6d. does not represent all the profit to be derived from those works. Many other towns are springing up into importance in the neighbourhood of Tunis, and we regard this as a favourable opportunity of proving to all interested in gas manufacture in that part of the world the economical advantages of the new system.

A SHAREHOLDER: Have you any security for the money advanced?

Mr. SPICE: We have a mortgage of the works—the first charge upon these works, upon which £40,000 have been expended, and, in addition, we have the concession, and we are advised the security is ample and unquestionable. At the present time the Foreign and Colonial Gas Company are paying our manager £500 a year, and while our manager remains there (a sort of "man in possession") they will continue to pay his salary. We have no obligation resting upon us—merely money to receive, and money to get back which we have advanced upon the security I have mentioned. The object of carrying on those works there is to prove to all foreign gas companies the great advantages to be derived from the use of half coal and half water gas. Leaving Tunis, and coming home to London, let me illustrate that point still further. We have had within the last few months the price of gas raised to the extent of 1s. 3d. per 1000 feet beyond the price the companies were allowed to charge under their Acts. In the case of the Chartered Gas Company the addition amounts to 1s. 8d., thus making the price charged by this company 5s.

A SHAREHOLDER: I am charged 6s. 3d.

Mr. SPICE: That is perhaps for cannel gas; I am confining my attention to the 16-candle gas, and 1s. 3d. is the addition awarded by the commissioners, who must be considered competent judges on these matters. Now, what are the facts? Why, that the gas companies have been paying a very high price for coals, and, as we have had a mild winter, the price of coke has been very low; and I have heard that the contractors for the coke at Beckton would have lost some £30,000, or thereabouts, if they had not been released from their contract by the company having taken the sale of coke into their own hands; for, at the time that they were paying a high price for coals, and they ought to have had the proportionate price of 15s. per chaldron for their coke, they were selling it at 7s. 6d. I am only sorry that we did not make this discovery earlier, so that we might have proved before those commissioners, who were appointed to consider the question of raising the price of gas in London, the excellence of our system, and so that we might have saved the gas consumers of London this additional charge of 1s. 3d. The thing would have worked thus, had our system been adopted: they would have used only half the coals, and have produced therefore only half the quantity of coke, and consequently had only half the coke to sell; and thus, the market not being glutted, the price would have been higher, and even some of that reduced amount of coke would have been used in the manufacture of our gas. Hence, I believe, they would not have wanted to advance the price a single penny. I am constantly appearing just now before parliamentary committees on gas questions, but my mouth is sealed, because I have no results to state. Owing to one thing or another affecting the construction of the works at the West London Junction, we have not been able as yet to get the thing into operation, so as to obtain definite results. But I hope before the session is over I may yet be able to open my lips about our system. All I want to do in connexion with these works is to satisfy the gasmen of London, and there will be no need of forcing the thing down their throats, for I believe prejudice will never stand in the way of gas companies using our system if its excellence be once proved, that the adoption of our scheme will save a large sum of money which they have now to spend. Let that once be clearly demonstrated to them and our success is assured. I do not mean to say they will save for our sakes; they will save for their own. Now, the object sought is to convince everybody that this gas will cost so much and no more. Well, you could not have better men to satisfy than Messrs. Quilter, Ball, and Co., your professional auditors. You all know they will never put their names to anything that is not in every respect correct and reliable. Therefore, in any statement I may have put before you and the world as to the cost of making this new gas and other details, I shall have first to satisfy this eminent firm of accountants of the correctness of the figures set forth. Now, I have set myself these two things to do, and if I fail to do them I shall say there is an end of the matter. I do not intend to advise you to invest any more money in this concern until I have proved its value beyond all doubt.

A SHAREHOLDER: Will it be water gas only, or coal gas and water gas?

Mr. SPICE: As we speak of it, it is coal and water gas mixed together in equal proportions.

The SHAREHOLDER: Then it is the gas we are now burning compounded with ours?

Mr. SPICE: Yes; that is found to be the most economical manner of dealing with it. I have distributed it and lighted up Chichester with it pure and simple; but the question is, which is the most economical? and, as I have stated, it is considered best to mix the two gases. You must have some solid matter to enter into the composition of gas, therefore we pass the gas through hot retorts, not only charged with iron, but coke, and with the gas is carried away so much solid matter.

A SHAREHOLDER: That was not the original idea.

Mr. SPICE: The original idea was to manufacture water gas pure and simple; but the most economical process is found to be a combination—half common gas and half water gas.

A SHAREHOLDER: Was it not originally intended to mix the light oil of petroleum with the water gas?

Mr. SPICE: Oh, yes; that is part of the system. With regard to the character of the gas, the cost of its manufacture, except that of the extra wear and tear, there is nothing originally stated that has not been borne out. As to the supply of petroleum, it can always be had; it is a drug in the market. There are immense quantities of it. There are immense petroleum fields totally undeveloped, simply because there is no demand for it. We wound up our affairs at Chichester because it would not pay us to put up my vertical retort system, the number of houses to be lighted was too few. The inhabitants, however, will probably use water gas even there, when we have once proved the success of this last improvement. We shall not have to force it anywhere; its good qualities, once proved and made known, will be sufficient recommendation. As regards Sydenham, our contract is not to light the Crystal Palace; the works are at Lower Sydenham. I am happy to say the contract we have entered into is to supply the Crystal Palace District Gas Company with gas at a certain price—I think it is 2s. 3d. per 1000 feet in the gasholders: and, provided we can show a profit on that, however small, the company's gas will be permanently supplied, mixed with coal gas, to the consumers of the district; and then, all things being satisfactory to the Crystal Palace District Gas Company's engineer, they will pay us a certain sum, I think £1000, towards what we have spent there. Therefore, there is no more money to be spent on the Sydenham works, but there is money to come back to us; in fact, we shall be paid for all the gas we have produced. That was not the case at Chichester. Then the process was untried, and we were glad to obtain, even at a great disadvantage, a field for our operations, with the view of proving this invention. All efforts for forty years have failed to get over the difficulties surrounding this subject. Of that period, I have been conversant with the subject for 20 years, and I have had my eye on all the experiments made. And I say that they have all failed, for reasons obvious to me, having looked carefully into the matter. In the case of White's patent, for instance, the process of manufacture was to mix up with the coal, resin, &c., whereas we make our gas first of all, and then mix it up with the light-giving matter by passing it through petroleum spirit.

A SHAREHOLDER: Would it not be better to try only one experiment at a time?

Mr. SPICE: That is just what we are doing. As you have been already informed, we have suspended operations at all our works except those at the West London Junction, where I believe we shall be lighting up the Great Western Station and Hotel within a month from the present time. In conclusion, I have only to say that I shall be most happy to explain any matter that I have left unnoticed to any gentleman desiring further information. We have, as I need scarcely assure you, been very anxious for the success of this concern; and I was perfectly horrified when I found that through some oversight we should have to meet you earlier than we expected, and thus be obliged to meet you without having anything to tell you as to absolute results. All I can offer you is the hope of success in the future, and it is a hope that I think I am justified in telling you to maintain. I believe you will be amply rewarded for your patience by the results which I confidently expect will be shortly realized, and I think it would be worse than folly to be downhearted at a time when we appear to be on the eve of success. The great question, and which the future alone can decide, is, will these retorts last so long as to bring the wear and tear within the original limits. Both Mr. Quick and I believe they will, and that opinion is shared by the best men of the gas world to whom we have exhibited the new plans.

A SHAREHOLDER: The whole thing, then, hangs upon the duration of the retorts?

Mr. SPICE: Exactly.

Mr. QUICK: After Mr. Spice's explanation—and he has gone into almost every detail, and answered every question raised—I think I should be only taking up your time unnecessarily if I were to trouble you with many observations. I have the utmost confidence and belief in the success of the experiment which is to be made at the West London Junction Gas-Works. Our former experiments and trials have practically reduced the matter to a question as to the expense of maintaining the retorts. In every other respect the process has answered perfectly. The one difficulty that many people apprehended, that it would be difficult to make the gas travel, is a difficulty that in practice has not arisen at all. At Chichester the brilliancy of the gas was quite as good at the end of the town as it was at the works. The trials we have made there proved that absolutely. And that is a difficulty that in other systems of various kinds of new gas has always interfered and prevented their success. I will not detain you further except by saying that I believe we shall shortly prove to the world we have overcome this last difficulty, and attained complete success. When that is accomplished, I think you will have every reason to be perfectly satisfied with the result.

The CHAIRMAN: I wish to reply to a few of the remarks which have been made. Among other things, it has been stated that all our operations have been totally fruitless of profit. Well, in the first place, we never proposed to set up rival works to the existing ones, but we simply proposed to demonstrate the excellence of our system. Our profits will be derived from royalties, licences, and patents, and that is what we are certain to make. We have already received applications for the purchase of our patents from foreign representatives, companies, &c., but we were obliged to state that we could not treat with them until the process of manufacture was definitely arranged. Then, as to why the payment of arrears of call has not been enforced—first, we do not want the money; and next, those shareholders who are in debt to the company are of course liable for interest on those arrears. And now allow me to state that, in your (Mr. Darvell's) observations you are quite mistaken in thinking that the gas companies have rejected our system; on the contrary, they are constantly making applications to us to enter into arrangements for the use of our gas. There has been no such thing as refusal to adopt our system, or disregard of the operations we have been carrying on. We are constantly getting from foreign agents, from gas companies, and others, the most urgent applications to know why there has been delay in making arrangements for the sale of our patents. Of course, no negotiations can be proceeded with until we are able to present the thing in a practical shape. Now, gentlemen, I hope I have answered those questions which have been put. I am sure you have heard with gratification the remarks of our general manager and engineer, because they are men who stand so high in their profession that you cannot believe they would do otherwise than convey to you their genuine belief in the success of this undertaking.

Mr. MAY: I would suggest to my brother shareholders that the report be adopted, but that it be clearly understood that we shall be called together again within four or six months, so as to allow our officers time to try finally these experiments. All I would say is, do not let us wait another year be-

fore we come together again; let it be understood that there shall be another meeting within six months.

The CHAIRMAN: Nobody will be so anxious to carry out that arrangement as we shall be.

Mr. SPICE: I feel personally very much obliged to the honourable proprietor for making that suggestion, which I entirely approve.

The resolution for the adoption of the report and accounts was then put and unanimously carried.

The CHAIRMAN: Gentlemen, all the directors retire from office on the present occasion, and as we cannot get on without directors, I beg to suggest that somebody move our re-election.

Mr. DARVELL: I have much pleasure in moving that you, my lord, and your colleagues be re-elected as directors of this company. Whether we fail or succeed, I do not believe that any blame can rest with the board.

Mr. BECKWITH: I beg to second the motion.

The resolution was carried unanimously.

The CHAIRMAN: Gentlemen, I cannot find words to express my thanks for the way in which you have re-elected us as your directors. We have worked hard in your interests, and we have experienced considerable annoyance when we found these continual delays in the completion of our scheme. We have done our best, and we shall continue to devote our best exertions to bring this concern to a complete success.

On the motion of Mr. BLUMER, seconded by Mr. FRIENDLY, Messrs. Quilter, Ball, and Co., were re-elected auditors of the company, and

On the motion of Mr. DARVELL, seconded by Mr. MAY, a vote of thanks was given to the chairman for his courteous conduct in the chair.

The proceedings then terminated.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The great strike of miners in Durham caused no little stir throughout the coal districts during its existence. As soon as it became clear that the men were determined to stand out, and that, therefore, both the iron industries of Cleveland, Cumberland, &c., would be paralyzed, as well as a total stop put to the shipping trade, inquiries, and, in many cases, orders began to pour into this district. London furnished most of these, but there were also others from various large towns and works generally supplied by Durham. The local owners were quite equal to the occasion, and tacitly decided not to execute any of these orders except at an advance of several shillings per ton. The settlement of the dispute will, to a certain extent, render this of little avail. Generally speaking, there is a moderate consumption of steam coal and engine slack, but the inquiry for coke, although stimulated during the week by the causes just alluded to, is not large, owing to the dulness of the Sheffield steel trade.

The principal foundries are still fairly employed, and, by the recent drop in pig iron, have been enabled to tender for pipes, &c., at a lower figure. No. 1 foundry pig iron is 75s.; No. 2, 67s. 6d.; No. 3, 65s.; No. 4, 62s. 6d.; No. 4 forge grey, 60s.; No. 5 forge, mottled, 59s.; No. 6 forge, white, 57s.; refined metal, 80s.; Kentledge, 75s.; and cinder, 55s., all for net cash at the works in Cleveland or North Yorkshire. About 3s. 6d. to 6s. per ton extra will lay it down in this locality. Best No. 1 Yorkshire pig is £4 2s. 6d. to £4 5s., and No. 3, for good general use, £3 15s. to £4. Considerable sales to founders and others were made at the beginning of last week, owing to the Durham strike, which caused inquirers to close at once to escape the stiffer prices which were immediately established by agents.

The Local Board of Rawmarsh, near Rotherham, are about to lay 600 yards of 2-inch and 300 yards of 3-inch water-mains, and are on the point of placing orders for the pipes.

On Friday the Rotherham Corporation paid a visit to the new reservoir at Ulley, and were entertained to dinner by Mr. Logan, the contractor. At the time, there were six million gallons of water in store, with an outflow of 400,000 gallons. The influx was 130,000 gallons from Morthen Brook, and 64,000 gallons from the Ulley Brook, making the average depth 6 feet 4 inches. Rain would be of much service here as elsewhere.

The Leeds Corporation ask for tenders for the purification and disposal of the sewage from the new works (nearly completed) at Knostrop.

The South Yorkshire and North Derbyshire colliery proprietors wish to reduce wages by 12½ per cent. The proposition has been submitted to the men, who will reply to the owners to-day (Tuesday). In the Dronfield district some of the miners are on strike.

Mr. Walter Ashton, of Warrington, for many years manager of the Warrington branch of the Manchester and Liverpool District Banking Company, has been appointed manager of the Sheffield Water-Works Company. The salary, it is believed, will be not less than that received by Mr. Waterfall, the late managing director—viz., £1000 per annum. Mr. Ashton will not be a director, and, consequently, will have no seat on the board.

THE NORTHERN COAL TRADE.

(FROM OUR OWN CORRESPONDENT.)

Last week everything in connexion with the northern coal trade was in confusion, and full of difficulties. As reported last week, the miners of the county of Durham agreed to a reduction of 10 per cent. upon their wages through a majority of the delegates. The dispute was looked upon as settled as regards the miners; but we showed in this column, some weeks ago, that if there was a dispute, the trouble would not arise with the pitmen, but with the brakesmen and off-handed men. It was proposed to reduce the wages of these persons 5 per cent., the pitmen 10 per cent. On Saturday night the men refused to accept the terms; and, to add to the confusion, a number of malcontents, who were hostile to the executive of the pitmen's union persuaded the men of several of the collieries not to submit to the reduction accepted by the executive. The brakesmen could have been easily dealt with, as their places would have been at once filled up; but if the malcontents could have secured a majority amongst the miners to refuse to accept the reduction, a strike of the most calamitous and formidable nature would, no doubt, have arisen. Trade was completely paralyzed until Thursday, when the pitmen's delegates reassembled at Durham, and, by a somewhat narrow majority of 16, determined to confirm the acceptance of the reduction. The brakesmen fell in with the same view; and the crisis was past. No special harm has been done. Many collieries that had stocks were able to work them off, and as there is a threatened strike in the iron trade, and a strike amongst the workmen in the chemical trade, most of the output of the Durham gas, household, and manufacturing collieries will, possibly, come to shipping this week, and any stocks that may have run short will soon be made up, as there is a considerable fleet of steamers in the Tyne ready to take in cargoes as soon as they are wrought at the collieries. In fact, a good deal of gas coals were placed on board steamers in the three last days of last week. There have not been many coasting ships in the northern ports, and the most of the gas cargoes that were shipped were placed on board steamers. Prices in the chemical trade improved somewhat last week; but as the men connected with several large factories upon the Tyne have struck work, there will not be much production in this trade for some days. The iron trade is also in a similar confused condition. General business is very moderate.

ADVANCE IN PRICE OF GAS AT ROCHDALE.—At the Rochdale Town Council quarterly meeting, held on Thursday last, Alderman Simpson, chairman of the Gas Committee, stated that the gas profits this year only amounted to £2000, whereas last year they were £11,000. The Gas Committee recommended that the price should be raised from 4s. 3d. per 1000 feet to 5s., which recommendation the council adopted by a majority.

INSTITUTION OF CIVIL ENGINEERS.—At the meeting of this society on Tuesday, May 5—Mr. Harrison, president, in the chair—Mr. William King, engineer to the Liverpool United Gaslight Company, was elected a member, and Messrs. T. H. G. Berrey, superintendent and manager of the Manchester Water Supply, and C. P. Gibbons, Stud. Inst. C.E., contractors staff, West Surrey Water-Works, were elected associates.

THE CHARTERED GAS COMPANY IN 1809.—The following curious advertisement appeared in *The Times* newspaper of July 12, 1809:—

GASLIGHT AND COKE COMPANY, 20, Featherstone Street, City Road. Half-past Six o'clock p.m., July 10, 1809.

Mr. Van Voorst takes this opportunity of congratulating the subscribers of the above concern in the eventual triumph of truth, justice, and common sense, for being this instant returned from *Pall Mall*, he is happy to inform the subscribers, from very great authority, that the idea of selling off the tubes, &c., be abandoned. Mr. Van Voorst intends publishing shortly the minutes of the meeting which produced the above beneficial result, as taken in shorthand by an eminent stenographer, and again most earnestly begs the subscribers not to dispose of their property in this most prosperous concern.

ACCIDENT AT THE PERTH GAS-WORKS.—About three o'clock Wednesday afternoon, two other plates in the new gasholder-tank gave way. It will be remembered that an accident of the same kind took place in December last, and the damage then done was repaired by the contractors, Messrs. Balfour and Co., Leven (Fifeshire), by supplying a new plate, and fixing up certain external supports to assist it until it was thoroughly tight. The time had now come for removing these supports, to see that the work had been properly accomplished, and it was on the removal of these supports that the two neighbouring plates on the same side gave way. Of course the immediate result of the accident was that a large quantity of water escaped. It is not yet known whether the responsibility lies with the contractors or the commissioners, as the plates may have given way through defective foundation, and not through any blame on the part of the makers of the tank.—*Perthshire Constitutional.*

PUBLIC OIL LAMPS IN PARIS.—Recently, the contracts for the maintenance of public oil lamps in Paris were decided at the Prefecture of the Seine. It might be supposed that the whole of the public streets in the capital would be lighted with gas. Such, however, is not the case, as there are still 1539 oil lamps in use. These are principally found in the old annexed communes, such as Grenelle, Ménilmontant, Charonne, La Chapelle, &c. It was hardly likely that any would be left even in the older portions of Paris, but the following official statements, given in *La Liberté*, afford some curious statistics:—In 1860 the annexed districts had 2434 gas lights, and 839 oil lamps. Last year Paris had 83,850 gas lamps, and 1539 oil lamps, of which 612 were in suburban districts. Consequently in Paris itself there are about 700 oil lamps. These are principally found in the Faubourgs of Saint Jacques, Saint Marcel, Saint Antoine, and in some small streets of the quarter Saint Martin. The maintenance of the 1539 oil lamps requires a staff of 72 persons for lighting, and the cost of lighting is about 4860 francs (£195) annually.—*Journal de l'Eclairage au Gas.*

SANITARY CONDITION OF NAPLES.—*The Times* correspondent writes, under date Naples, April 28:—"At last the contract for supplying Naples with water has been signed by the Syndic and the representatives of the General Credit and Discount Company. Which party has got the best of the bargain it would be useless now to inquire, though one cannot help surmising. A question, however, which has occupied public attention for 30 years is now set at rest, and a step in advance has been taken towards purity and decency. How many years will it require to settle that other great—even greater—sanitary question, the sewerage of Naples, which has been already under discussion for more than one or two generations? Yet perhaps no city in Europe, from its position, would seem to present greater facilities for relieving itself of its sewage. The force of gravitation would alone be sufficient to carry it off where it might be utilized to the immense advantage of a dense population, who are for ever exclaiming about their poverty. For this reform we must wait probably till the bills of mortality rise somewhat higher.

GAS AFFAIRS AT BUENOS AYRES.—The *Liverpool Journal of Commerce* says:—"We have been requested to publish the following:—The municipality, whilst owing 8,000,000 dols. m/c to the gas company, contracted with a new company for lighting the town from March 4 this year. This company was not ready by the time agreed, and the old company declined on the 6th of March to supply more gas without a settlement of their account. The municipality having obtained, from the governor of the province, authority to use the police force, on the evening of the same day proceeded to light the public lamps with their own men; took possession of the gas-works, breaking open the gates to obtain an entrance, and compelled the men found inside to continue at their work by blows with the butt of the policemen's muskets and threats with the bayonet point. In reference to the above it may be stated that there is a direct municipal tax for lighting, that said tax was collected by the municipality, and, though more than enough to cover the cost of lighting, the proceeds from the tax were applied to other purposes than paying for the gas used. Besides, even if the gas company (and not the municipality) itself had terminated the contract, and the gas company been the debtors instead of the reverse, any embargo without judicial order would be entirely illegal, and it may be seen by the order below that the municipality did not add the crime of murder to that of robbery with violence only because the gas company did not defend their property, as they would have been justified in doing. The order from the president of the municipality to the first officer, Don Thomas Oliver, was: 'Your notice received stating that the gate is closed that gives entrance to the gas works, of which you have been ordered to take possession. In reply, you are authorized to take possession, forcing the gates and overpowering any obstacle, employing for the purpose the force at your orders.—(Signed) MIGUEL NAZER; B. LLORENTE, Secretary.'" Since the above transactions, we understand the municipality, conscious, no doubt, of the impropriety of the course they had adopted, have returned the works into the hands of the gas company, but as they have not paid their debts, and the company refuse to trust them any longer, the town is now lighted with kerosene.

OLDHAM CORPORATION WATER SUPPLY.—At the meeting of the Gas Committee of the Oldham Corporation on the 29th ult., Mr. Wrigley in the chair, Mr. Bamford, a plumber, appeared on summons to answer a charge of having contravened the 136th section of the Borough Improvement Act, which says:—"It shall not be lawful for any owner or occupier of any building supplied with water by the corporation, or any other person, to affix, or cause or permit to be affixed, any pipe or apparatus to a pipe belonging to the corporation, or to a communication or service pipe, belonging to or used by such owner, occupier, consumer, or other person, or to make any alteration in any such communication or service pipe, or in any apparatus connected therewith, without the consent in every case of the corporation; and if any person acts in any respect in contravention of the provisions of the present section, he shall be liable to a penalty not exceeding £5, without prejudice to the right of the corporation to recover damages from him in respect of any injury done to their property, and without prejudice to their right to recover from him the value of any water wasted, misused, or unduly consumed." It appeared from a statement made by the chief clerk that the outdoor superintendent visited the Central Mill, and found that Mr. Bamford had caused a direct communication between the corporation mains and the condensers of the engine. There were also plug taps attached, instead of taps tested and stamped by the corporation, which ought to have been affixed according to one of the rules regulating the water supply. All this had been done without the consent of the corporation. Mr. Bamford said he always

thought they could do what they liked after the water had passed through the meter. He had been a member of that committee, but he did not know that there was a rule prohibiting what he had done. However, it seemed to be against the regulations of the committee, and he had only to say that the offence had been committed in ignorance. The chairman said it was a direct violation of the rules of the committee to have such a communication between the water-mains and steam engines and boilers. There ought to be a cistern between. On the motion of Councillor Buckley, it was decided that for this time the offence be looked over, and that Mr. Bamford be told that such communications are not allowed. There was a similar charge against Messrs. Buckley and Taylor, Castle Iron-Works. From the report of the outdoor superintendent it appeared that Messrs. Buckley and Taylor had allowed a direct communication to exist between the water-mains and their boilers. When told it was against the rules, they said they would "do as they liked." It was decided that they should be summoned before the committee. The chairman stated that the practice was extensively indulged in, and some people thought they really could do as they liked after the water had passed through the meter. It was stated that one result of such communications was that the water was liable to back-flow, thus damaging the meter, and getting into the mains again.

TUNBRIDGE WELLS GAS SUPPLY.—At the meeting of the Improvement Commissioners, on Wednesday last, the Gas Bill Committee reported the result of the House of Commons committee's decision on the gas bill. After giving their opinion on the decision, the local committee state that it is still open to the board to oppose the measure in its further stages, and with the requisite consent to do so, with the town money, under the powers of the Borough Funds Act; but the committee were most reluctant to continue the contest in Parliament. Their great desire is to effect the transfer on terms which will be satisfactory to both parties, and they accordingly wrote to the gas company to this effect, and asking whether the latter were willing to introduce clauses into their bill to enable the local board to purchase the gas undertaking on terms to be ascertained under the arbitration clauses of the Lands Clauses Consolidations Act. The gas company replied that the directors could not insert the proposed clause in their bill without the instruction of the shareholders, who should be called together at the earliest opportunity to consider the subject. Under these circumstances, the committee asked for the sanction of the board to the introduction into the bill of the clauses referred to in the first of the above resolutions, in order that, if assented to by the gas company, the same might be accordingly added in the House of Commons, with such consequential amendments as might make the same agree with the rest of the bill. In case the company did not consent to the clauses referred to, the committee were of opinion that the opposition should be continued in the House of Lords, and recommended that a petition to that House, similar to the one presented to the House of Commons, be adopted by the Board, and that the seal be affixed thereto by the chairman. The committee were informed that they would have the same guarantee of funds to meet the costs which they had in the House of Commons. They retained as strongly as ever their objections to gas-works in the High Rocks valley, considering that the most beautiful and popular place of resort in the neighbourhood would be disfigured and polluted by works of this nature. Mr. Browell moved the adoption of the report, which was seconded by Mr. Wigg. Mr. Adie did not consider it worth while, if they were going to call the same evidence before the House of Lords as before the committee of the House of Commons, going to the expense of continuing the opposition, and he therefore proposed as an amendment that that part of the report should be expunged. Mr. Oakley seconded; but, on being put, the original resolution was carried.

Register of New Patents.

2543.—HEDLEY, T. A., Abchurch Lane, London, "*Improvements in the manufacture, combination, and purification of gases for lighting and heating purposes, and in the apparatus employed therein.*" Patent dated July 25, 1873.

This invention relates to improvements, with the object (amongst others) of producing gas of a superior quality and in greater quantity from any given amount of gas-producing material, and also with more dispatch than has hitherto been obtained, and also with the object of effecting economy and simplicity in the apparatus used in production, and of rendering the process of manufacture innocuous and free from nuisance to the surrounding neighbourhood.

According to the invention, the generating apparatus or retorts (which may be of any suitable form and material) are erected vertically or at an angle of inclination, instead of horizontal as they are usually employed, and are constructed so as to form two, three, four, five, or more sections divided by perforated division plates. They may, however, be made in separate pieces fastened together by any suitable means. The sections are provided with a mouthpiece so that they may be charged separately with like or different materials, and when necessary they may also each be provided with a second mouthpiece for drawing the charge. When, however, such second mouthpieces are not provided, the several sections can be emptied only by turning over or breaking up the perforated division plates, and thus allowing the contents of the different retorts to fall to the bottom, where they may be removed. All or part of these sections are also provided each with an internal cylindrical or other suitably shaped passage, open at both top and bottom, and supported on the perforated division-plate. These passages are also each provided at the upper end with a sliding lid, so that they may be closed when required, for the reason that sometimes it may be unadvisable to convey the gas through the material with which any one or more of the sections may be charged. When this is the case, the internal passage is uncovered, when the gas, of course, ascends through the free channel, in preference to forcing its way through the material with which the section may be charged. When this internal passage is closed, the gas, of course, ascends through the surrounding annular space. When it is required to shift one of these sliding lids, the door of the mouthpiece of that particular section has to be removed, when the sliding lid may be easily reached with a rod. It is preferred to make the perforated plates, internal passages, and sliding lids of fire-brick or clay. When the retorts are cast all in one piece, the plates and the pieces forming the internal passage are let down from the top, this resting on lumps cast on to the retort. Where, in letting them down to the lower sections, they have to pass the lumps, at the sections above, channels are formed in the plates to enable them to pass. The lower of the sections is usually charged with the coal or other gas-generating material, and the upper sections as follows:—That one nearest to the gas-generating material with chalk or limestone, the next with coke, next with pieces of wood or charcoal, and the uppermost with scrap iron.

The gases generated in the lower section of the retort, either alone or combined with steam or air introduced into one or more of the sections, ascends through the sections above as described, and thence is led away through the usual apparatus of a gas-works.

When desired, the above process may be reversed by placing the gas-generating section and material at the upper end, and drawing the gas generated downwards through the remaining chambers by means of an exhaust.

2544.—MAIN, E. W., Newcastle-upon-Tyne, "*An improved sanitary safety-valve for preventing the admission of foul air and gases into dwelling-houses, and their escape from common street sewers and drains.*" Patent dated July 25, 1873.

According to this invention the foul air is prevented from rising, by means of valves with india-rubber lips, which close together by their elasticity to prevent the upward passage of gases, but yield to allow water to descend.

2569.—FARROW, S., Ashton-under-Lyne, "*Improvements in the construction of cocks or taps.*" Provisional protection only obtained. Dated July 29, 1873.

This invention consists in certain improvements upon the cocks or taps, for which former a patent was granted to the present inventor on the 6th of October, 1869, No. 2897, whereby the cocks or taps are made more suitable for very high pressures, by being made with corresponding passages in the barrel and in the taper plug, thus equalizing the pressure.

2599.—SEEGERS, L., Cecil Street, Strand, London, "*Improvements in an apparatus for a gas economizer, an apparatus for increasing the illuminating and heating powers of coal gas with reduced consumption.*" Provisional protection only obtained. Dated July 31, 1873.

This invention consists of an improved apparatus, containing a certain portion of fluid obtained and distilled from petroleum, known under various names and denominations, such as benzolin, &c., &c., for the purpose of combining the ordinary coal gas with it in its right proportions, according to its requirements, and being self-regulated by a floater or ball cock and ball system. The gas, when so combined, is productive of considerable additional illuminating power. One light of the prepared gas is equal in brilliancy to the extent of about two and a half times that of one ordinary coal gas light; the same burners being used in both cases.

The apparatus has, at the top, a reservoir, containing a quantity of the fluid, which continuously supplies the apparatus with the requisite amount required for combinating with the ordinary coal gas, and is self-regulated by the floater or ball cock and ball system. The ordinary coal gas is conveyed from the meter by a tube into the apparatus, and thence, after various circulations, the prepared gas is discharged by an outlet tube ready for consumption.

In using an apparatus, by which such great advantages and improvements are gained, there is at the same time a saving in the consumption of the ordinary coal gas of about 20 per cent., more or less, in accordance with the size of the apparatus in use. The consumption of the fluid is little in proportion to the great economic advantages derived from it. No heat whatever is required or necessary to the working of the apparatus when in use.

APPLICATIONS FOR LETTERS PATENT.

1530.—BRINE, G. J., and ALLEN, T., Southsea, Hants, "Improved cisterns or cistern apparatus for discharging or flushing at intervals, and preventing waste of water." May 1, 1874.

1531.—GERCKE, K. L. H., Berlin, "Improvements in apparatus for regulating and measuring the flow of gas or other fluids." May 1, 1874.

1550.—KNOWLES, Sir F. C., Bart., Lovell's Hill, Berks, "Improved manufacture of gas for heating purposes." May 2, 1874.

1567.—LOWNE, R. M., Finchley, Middlesex, "Improvements in anemometers and other fluid-meters." May 4, 1874.

1584.—SUGG, W. T., Vincent Street, Westminster, "Improvements in apparatus for regulating the supply of gas." May 5, 1874.

1589.—LENOIR, F., Paris, "Improved apparatus for carburetting gas." May 5, 1874.

1602.—FISHER, D., Pimlico, Middlesex, "Improvements in meters for measuring water and other fluids." May 6, 1874.

1619.—FROST, H., Manchester, "Improvements in fluid-meters, applicable also to apparatus for obtaining motive power and for pumps." May 7, 1874.

GRANTS OF PROVISIONAL PROTECTION.

1157.—BIRCH, R. W. P., Victoria Street, Westminster, "Improvements in apparatus for flushing sewers, drains, reservoirs, and other waterways, applicable also for discharging measured quantities of water or other fluid." April 2, 1874.

1169.—VOISIN, J. A., and DRONIER, P., Paris, "An improved method of and apparatus for producing a light." April 4, 1874.

1390.—CRAWFORD, A., Glasgow, "Improvements in water-closets, and in waste-preventing water-supply apparatus." April 22, 1874.

1424.—WILSON, M., Brixton, Surrey, "An improved method of and apparatus for supplying oxygen in rooms and other closed places wherein the air is vitiated by the burning of gas or other lights." April 24, 1874.

1426.—TOWLE, J., Oxford, "Improvements in the means employed for collecting, treating, and distributing sewage." April 24, 1874.

1430.—THOMSON, W., Glasgow, "A new or improved tube-expander." April 24, 1874.

1435.—LOWE, C., and GILL, J., Manchester, "Improvements in the manufacture and separation of certain mixed coal-tar products." April 24, 1874.

NOTICES TO PROCEED.

4202.—AUTIER, C., Paris, "A new and improved pressure cock for the passage of gas and fluids, self-shutting or closing at will." A communication. Dec. 22, 1873.

24.—CURTIS, F., Boston, U.S.A., "Improvements in lamps." A communication. Jan. 2, 1874.

117.—LIGHBODY, W., Bow, Middlesex, "Improvements in lamps." Jan. 8, 1874.

1065.—PEACOCK, J. C., Finsbury Park Road, London, "An improved form of stove and apparatus connected therewith for heating, lighting, ventilating, and cooking." March 27, 1874.

1211.—THOMAS, C. W. W., Buckhurst Hill, Essex, "Improvements in apparatus for manufacturing heating and illuminating gas." April 7, 1874.

1260.—MOULE, Rev. H., Fordington, Dorset, "Improvements in the production and manufacture of gas." April 11, 1874.

1286.—LAKE, W. R., Southampton Buildings, London, "Improvements in pumps." A communication. April 14, 1874.

1336.—THOMPSON, N., Brooklyn, U.S.A., "Improvements in means for connecting together pipes or tubes, and for connecting cocks, tubes, or pipes to other articles." April 17, 1874.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3628.—NUTTALL, F. D., St. Helen's, Lancs, "An improved arrangement of gas-box and reversing gear, applicable to Siemens's regenerative gas-furnaces." Nov. 7, 1873.

3632.—FRASER, A. C., New Barnet, Herts, and WATSON, W., Great Ayton, near Northallerton, Yorks, "Improvements in treating and utilizing sewage." Nov. 7, 1873.

3636.—DARLINGTON, F. A., St. Helen's Place, and SCOTT, F., Portland Place, London, "Improvements in machinery for charging and discharging gas-retorts." Nov. 8, 1873.

3669.—BOYELL, R., Birmingham, "Improvements in apparatus for regulating and controlling the flow of liquids." Nov. 8, 1873.

3663.—INGRAM, J. G., Hoxton, Middlesex, "Improvements in the manufacture of flexible metal piping and tubing." Nov. 11, 1873.

3742.—SCOTT, H. Y. D., Ealing, Middlesex, "Improvements in the purification of sewage water." Nov. 18, 1873.

3848.—LAKE, W. R., Southampton Buildings, London, "Improvements in gas-engines and in apparatus for producing gaseous mixtures to be used in the same." A communication. Nov. 25, 1873.

353.—CHARLES, P., Stoke Newington, Middlesex, "Improvements in apparatus for controlling the supply of water to closets, lavatories, and other places, and preventing waste." Jan. 28, 1874.

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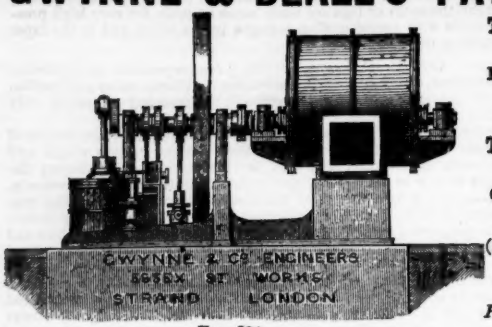

FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

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(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

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FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES, CAN BE HAD ON APPLICATION TO

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FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

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Lead services. Wages good.
Address, the MANAGER, Water-Works, YEOVIL.

WANTED, by a young Man, a situation as Meter-Fixer, Fitter, Index-Taker, Service-Layer, &c.
Address R. M., care of Mr. Clark, 14, Nelson Street, Tidal Basin, Victoria Docks, LONDON.

WANTED, by an active and persevering young man, of good experience and unexceptionable references, an appointment as CLERK, or in any position of trust.
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WANTED to Purchase, a cast-iron TANK and GASHOLDER, to contain from 15,000 to 25,000 cubic feet. Must be in good condition.
State price and full particulars to Mr. J. WATERMAN, Gas-Works, Eye, SUFFOLK.

WANTED to purchase, 5000 to 10,000 tons of GAS COKE. Waggons can be sent to any station for any proportion of above.
Address G. J. EVESON, Gas Coal and Coke Merchant, STOURBRIDGE.

THE Advertiser, having 14 years practical experience, is open to an engagement as Meter Inspector, Fitter, and Service-Layer, or as Manager of Gas-Works making about 5,000,000 per annum. Excellent testimonials and references.
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For particulars, apply to Mr. ALFRED LASS, 60, Cornhill, LONDON, E.C.

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FOR SALE—14 12-in. and 5 10-in. Slide- VALVES with outside racks. They have been thoroughly re-fitted, and are equal to new. A low price will be accepted to effect a clearance.
Apply to JAMES WATSON, Engineer and Manager, Crystal Palace District Gas Company, LOWER SYDENHAM, S.E.

FOR SALE, and ready for immediate delivery by the Barnstaple Gas Company, about 35 ft. of 12-in. Hydraulic Main, in five lengths; 15 ft. of 16-in. Hydraulic Main; cast-iron Stools for ditto; 21 15-in. Mouthpieces; a number of Ascension-Pipes, Bridges, and Dips; together with a quantity of odd castings suitable for a small work.
Feb. 26, 1874.

THE Directors of the Farnham Gas Company invite TENDERS for the supply of 1100 tons of New Pelton or Pelaw Main GAS COALS.
Particulars can be had by applying to the SECRETARY.

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IN
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Retort-Setters sent to all parts of Europe and America.
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HAY GAS-WORKS.

TAR, about 2000 gallons; Lime, about 30 tons, at a low price. Two cast-iron Purifiers and Connexions. Six Retort Mouthpieces. Purifiers in good condition. Lids not so good. Price £20.
Apply to the SECRETARY, Hay, SOUTH WALES.

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1 10-horse Table Engine, and 20,000 per hour Anderson's Exhauster, with Shafting and 4-inch Water and Tar Pumps, horizontal, on bed plates.
2 Scrubbers, about 6 ft. diameter, 18 ft. high, and
6 8-ft. square Purifiers, with covers and lifting gear complete; also connexions and valves to same.
The above are at work and may be seen at the Consumers Gas-Works, High Street, WOOLWICH.

THE London and North-Western Rail- way Company have FOR SALE two GASHOLDERS, with columns, girders, &c., complete, one being 35 ft. and the other 34 ft. diameter, each 20 ft. lift. Possession can be had in a fortnight.
Also a set of four PURIFIERS, each 10 ft. square. These are now at work, but may be removed about August next.
To view the same, apply to Mr. F. W. WEBB, the Company's Locomotive Superintendent, at CREWE.

TO IRONFOUNDERS.

THE Oldham Corporation Gas and Water Works Committee are prepared to receive TENDERS for supplying and fixing a set of PURIFIERS.
Plans and specification may be seen at the Gas and Water Offices, Oldham.
Tenders (endorsed) to be sent in to the undersigned on or before Tuesday, May 26.
The lowest or any tender not necessarily accepted.
By order,
Oldham, May 5, 1874. H. BOOTH, Town-Clerk.

TO COLLIERY PROPRIETORS AND OTHERS.

THE Gas Committee of the Bury Im- provement Commissioners are prepared to receive TENDERS for the supply of about 8000 tons of COAL and 4000 tons of CANNEL, to be delivered at the Railway Station, Bury, in equal monthly quantities, from the 1st of June, 1874, to the 30th of April, 1875.
Further particulars may be obtained from the undersigned.
Sealed tenders, endorsed "Tenders for Cannel and Coal," to be sent in on or before Monday, the 18th day of May inst.
By order,
JOSEPH WOOD, Engineer and Manager.
Gas-Works, Bury, May 6, 1874.

TO COKE MERCHANTS AND OTHERS.

THE Directors of the Northampton Gas- light Company are prepared to receive TENDERS for the surplus COKE produced at their works for Twelve months, from the 1st of July, 1874, at per ton, weighed on the Company's machine.
The terms of the contract may be seen at the Office of the Company, in Mill Lane, Northampton.
Tenders to be delivered at the Company's Office, on or before the 26th day of May next, addressed to the Manager.
The Directors do not pledge themselves to accept the highest or any tender, and will require satisfactory sureties.
WILLIAM DENNIS, Secretary.
Northampton, April 23, 1874.

TO COALOWNERS.

THE Directors of The Gaslight and Coke Company are prepared to receive TENDERS for a supply of COALS, in accordance with a specification to be obtained at this Office.
The principal works of the Company are accessible by railway, in direct communication with all the inland coalfields, as well as by screw colliers from the Northern coalfields.
Tenders to be sent in to me on or before Tuesday, the 26th day of May next.
By order,
JOHN ORWELL PHILLIPS, Secretary.
Chief Office, Horseferry Road, Westminster, S.W.,
April 25, 1874.

MANCHESTER (CORPORATION) GAS-WORKS.

TO TAR DISTILLERS, CHEMICAL MANUFACTURERS, AND OTHERS.

THE Gas Committee are prepared to receive TENDERS for the purchase of either the whole or portions of the GAS TAR and AMMONIACAL LIQUOR that may be produced at their Gas-Works, situate at Gaythorn and Gould Street, Rochdale Road, respectively, for the term of One or more years, as may be agreed upon, to commence from the expiration of the periods of the existing contracts. The period of the existing contract for Gas Tar will terminate on the 28th day of February, 1875, and for the Ammoniacal Liquor on the 31st day of December, 1875. Sealed tenders, addressed to the Chairman of the Gas Committee, Albert Chambers, Albert Square, and endorsed "Tender for Gas Tar," or "Tender for Ammoniacal Liquor," as the case may be, must be delivered at this Office on or before Thursday, the 14th day of May next.
The Committee do not bind themselves to accept the highest or any tender.
Forms of tender and further particulars as to quantities and conditions of contract may be obtained on application to Mr. Thomas Peacock, at this Office, on and after Tuesday, the 21st of April instant.
By order,
JOSEPH HERON, Town-Clerk.
Gas Office, Albert Chambers, Albert Square,
April 17, 1874.

PATENT FUEL AND LIME FOR PURIFYING FROM FOUL LIME.
By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.
Licences to work the invention will be granted to Gas Companies on very reasonable terms.
For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.
The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

BUENOS AYRES GAS COMPANY.
The ABOVE NAMED and the "Mutual Gas Company," newly established at Buenos Ayres, are ENTIRELY DISTINCT Companies.
LOUIS WILDE,
Agent for the Buenos Ayres Gas Company.
4, Cable Street, Liverpool, May 6, 1874.

THE Directors of the Clayton, Allerton, and Thornton Gas Company are prepared to receive TENDERS for the erection of Four Beds of Through RETORTS, six retorts in a bed, labour only, the Company finding all material.
Plans and specifications may be seen on application at the Office of the Company.
Tenders, addressed to the Chairman, endorsed "Tender for Retort Settings," to be sent in on or before Monday, the 18th day of May, 1874.
The Directors do not bind themselves to accept the lowest or any tender.
By order,
JOHN NIVEN, Engineer and Manager.
Clayton, near Bradford, May 1, 1874.

THE Directors of the Clayton, Allerton, and Thornton Gas Company are prepared to receive TENDERS of price per cwt. for the supply of Castings, &c., 48 Mouthpieces, oval shaped, also Ascension-Pipes, H-Pipes, Dip-Pipe, Retort-Lids, Furnace Frames and Doors, &c. Also tender for fixing same.
Plans and specifications may be seen on application at the Office of the Company. The contractor will be expected to take the old metal contained in a number of similar and sundry other castings, which may be seen at the works, the highest price for which must be stated in the tender.
Tenders, addressed to the Chairman, endorsed "Tender for Retort Castings," to be sent in on or before Monday, the 18th day of May, 1874.
The Directors do not bind themselves to accept the lowest or any tender.
By order,
JOHN NIVEN, Engineer and Manager.
Clayton, near Bradford, May 1, 1874.

BOLTON CORPORATION—GAS DEPARTMENT.

CONTRACTS FOR CANNEL AND COAL.

THE Gas Committee are desirous of receiving TENDERS for CANNEL and best GAS COAL or NUTS, in quantities of not more than 10,000 tons or less than 3000, for the year commencing the 1st of July next, to be delivered free at the Bullfield or Craddock Lane sidings of the Lancashire and Yorkshire Railway, at Bolton, or, if carted, at the Gas Street or Lum Street works, as may be required.
Sealed tenders, endorsed "Tender for Coal," specifying the description of Cannel or Coal, the pits at which they are to be raised, and the quantities proposed to be supplied, to be sent to the Chairman of the Committee, Thos. W. Holden, Esq., on or before Tuesday, the 2nd of June next, stating also cash terms for monthly payments.
The Committee do not bind themselves to accept the lowest or any tender, but the person or persons whose tender may be accepted, will be required to execute an agreement for the due performance thereof.
By order,
R. G. HINNELL, Town-Clerk.
Gas Offices, Bolton, May 7, 1874.

BOLTON CORPORATION—GAS DEPARTMENT.

CONTRACTS FOR TAR.

THE Gas Committee are desirous of receiving OFFERS for the TAR produced at the Gas-Works, in Gas Street and Lum Street. Quantity yearly about 2000 tons. The Tar will be delivered into Contractor's tanks free, at the Bullfield or Craddock Lane sidings of the Lancashire and Yorkshire Railway Company, at Bolton.
Sealed tenders, endorsed "Tenders for Tar," stating prices offered for a term of Three, Five, or Seven years, to be sent to the Chairman of the Committee, Thos. W. Holden, Esq., on or before Tuesday, the 19th inst.
The Committee do not bind themselves to accept the highest or any tender, but the person or persons whose tender may be accepted, will be required to execute an agreement for the due performance thereof.
By order,
R. G. HINNELL, Town-Clerk.
Gas Offices, Bolton, May 7, 1874.

BOLTON CORPORATION—GAS DEPARTMENT.

CONTRACTS FOR LIME.

THE Gas Committee are desirous of receiving TENDERS for the fresh-burnt LUMP LIME required for the year commencing the 1st of July next. The quantity will be about 1000 tons, and will have to be delivered as directed by the Gas Engineer, at the Bullfield or Craddock Lane sidings of the Lancashire and Yorkshire Railway Company, at Bolton.
Sealed tenders, endorsed "Tenders for Lime," to be sent to the Chairman of the Committee, Thos. W. Holden, Esq., on or before Tuesday, the 19th inst.
The Committee do not bind themselves to accept the lowest or any tender.
By order,
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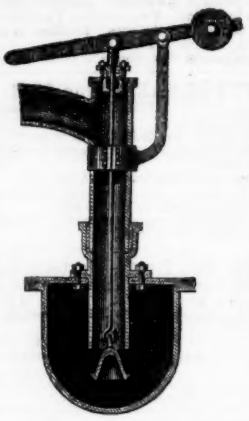

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Affords a clear gas way through the dip-pipe while the retort is in action, and produces a perfect seal at pleasure, or whenever the retort is open, offering great security against the drawing of air, and obviating the necessity for using any liquid in the now so-called hydraulic main. It is easy of application to existing apparatus, and is comparatively inexpensive. Is not likely to get out of order, as the tar, which will adhere to the bottom of the dip-pipe and the flange of the cone, both of which are faced, will act as a lubricant, and prevent undue wear and tear. The whole, as will be seen on inspecting the accompanying illustration, is exceedingly simple, and every part accessible. To adapt it to the present dips, all that is necessary is to face the bottom edge of the dip-pipe, and suspend a cone by a rod, which passes through the bonnet, the raising and lowering of the cone being performed through the intervention of a weighted lever.

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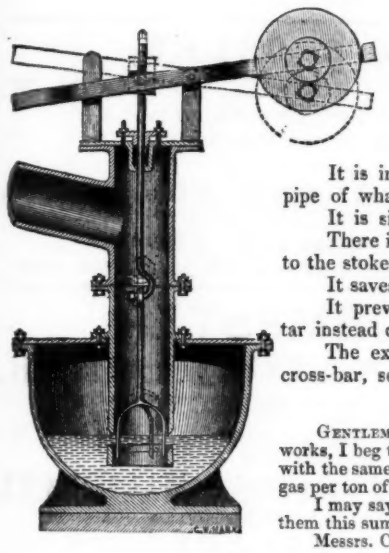
LIMITED.

PATENT IMPROVED SEAL

FOR

GAS HYDRAULIC MAINS.



It relieves the retorts from all pressure during the time gas is being made.

The end of the dip-pipe not being immersed in the tar, permits the gas to pass freely, and without pressure, from the retort into the hydraulic main.

The dip-pipe can be effectually sealed without trouble, to resist the back rush of gas, *to any possible pressure*, during the time of charging; but in the event of the Seal being left on, after the retort is closed, no inconvenience is caused, as the piece of pipe used as the Seal only lengthens it to an ordinary dip-pipe.

It is inexpensive, and can be easily and readily applied to any existing hydraulic main and dip-pipe of whatever shape or size, at a trifling cost.

It is simple in its arrangement, and cannot get out of order.

There is no deposit of carbon on the top of the retort, thereby saving considerable time and trouble to the stokers when drawing and charging, also the injury caused by scurfing the retort is avoided.

It saves 10 per cent. of the coal carbonized; also the same proportion of fuel, retorts, labour, &c.

It prevents the thickening of the tar in the hydraulic main, as the heated gas passes *over* the tar instead of being forced *through* it.

The extension piece of pipe is moved by a lever, from which hangs a $\frac{3}{8}$-inch rod, hooked on the cross-bar, so that the lid of the retort cannot be struck without first sealing the pipe.

Alton Gas and Coke Company, Alton, Hants, April 25, 1874.

GENTLEMEN,—In reply to your inquiry respecting your Patent Dip for Hydraulic Gas-Mains in use at these works, I beg to say that, upon looking into our carbonizing account for the last 12 weeks, and comparing the result with the same quarters of the past five years, I find that your Dip has given our Company an increase of 1286 feet of gas per ton of coals beyond the make in the other years, notwithstanding the retorts have been in use for three years.

I may say that our Company are so satisfied with the Dips that it is intended to fit up the other retorts with them this summer.

I am, gentlemen, your obedient servant,

Messrs. Caffall, Thomas, and Co., Limited, 28, Gracechurch Street. WM. TRIMMING, Secretary.

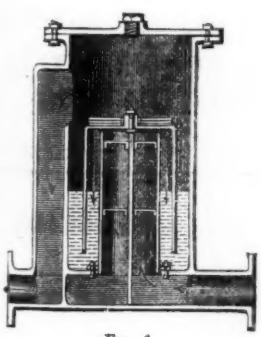


FIG. 1.

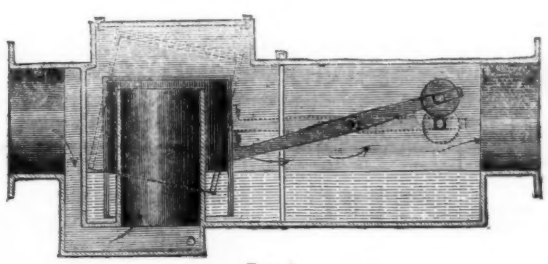


FIG 3.

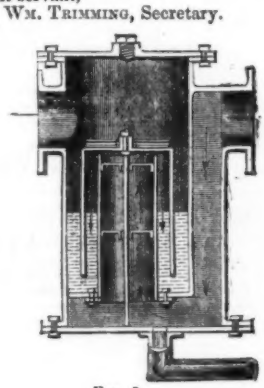


FIG. 2.

BYE-PASS FOR EXHAUSTER (Fig. 1).

This Hydraulic Bye-Pass has been invented for the purpose of supplying to gas companies a cheap, effective, and self-acting valve. It is simple in its construction, cannot get out of order, perfect in its action, can be made to stand any pressure, occupies very little space, and can be adapted to any existing pipes.

Fig. 2 is a Valve similar to Fig. 1, but made to act as a self-acting hydraulic bye-pass for washers, condensers, scrubbers, and meters; the Valve part being *below* the inlet and outlet, so that it may be applied to underground mains. Both Valves can be fitted to existing mains without disturbing them, more than the cutting out of a sufficient length to permit the fitting in of the Valve; after being properly fitted, they will require no further attention.

SELF-ACTING HYDRAULIC SAFETY-VALVE (Fig. 3),

For preventing the back flow of gas from the gasholder, and thereby preventing the possibility of accidents (the great damage and danger to life and property resulting therefrom) through the breaking of pipes, unsealing of purifiers, or any other cause. It is easy and prompt in its action, for upon the forward pressure of the gas ceasing, the bonnet *instantly* closes over the stand-pipe, thereby effectually preventing any return of the gas; no extra pressure is put upon any part of the works by its use, and it can be made to stand any required pressure.

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CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

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BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.

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And every Description of Gas Apparatus
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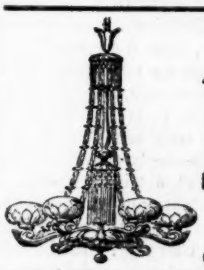

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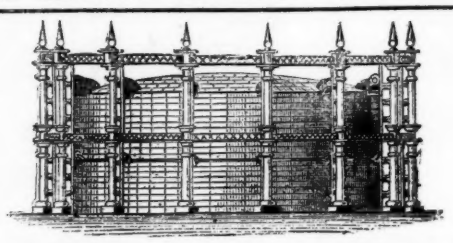

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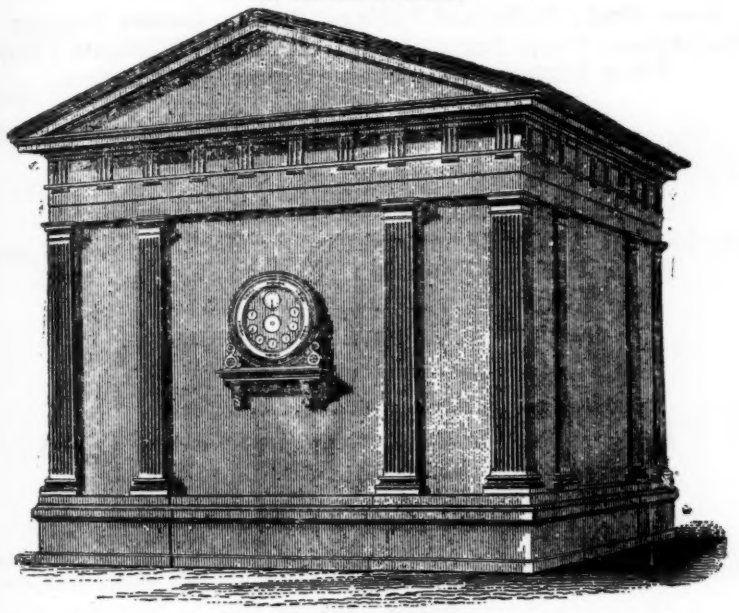

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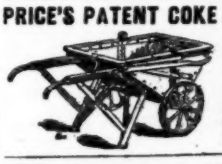

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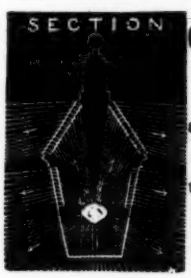

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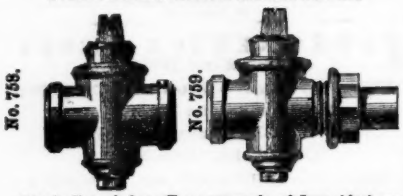

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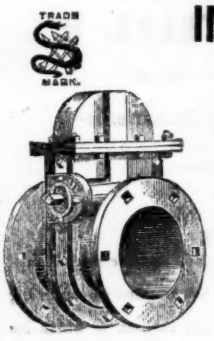

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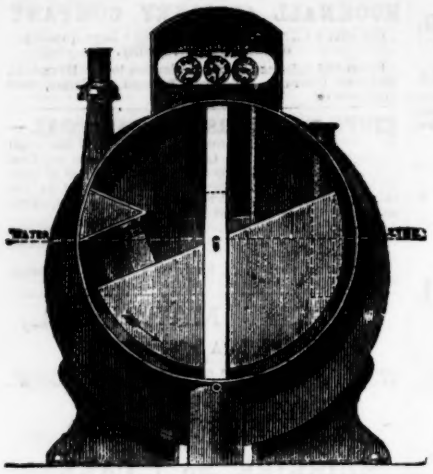

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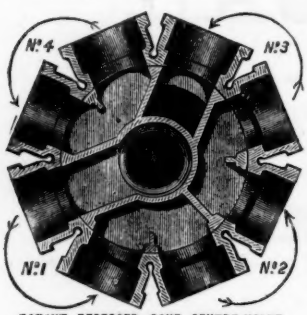

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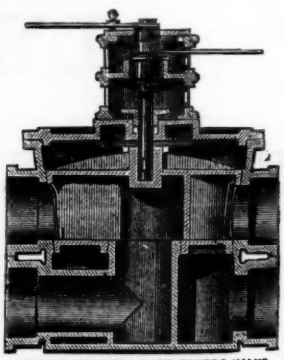

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